

## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Camie S. Thompson Examiner #: 79244 Date: 12/26/02  
Art Unit: 1776 Phone Number 30 54484 Serial Number: 09/065,818  
Mail Box and Bldg/Room Location: C/B 11/B/28 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Compound having pyrrole ring + light emitting device  
Inventors (please provide full names): Toshiki Taguchi

Earliest Priority Filing Date: 9/29/2000

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

US 20020041979

Please do a search and a CAS search on  
claims 1-24 with the pyrrole compound  
listed in claim 1. Please see attached  
Thank you.

## STAFF USE ONLY

Searcher: <u>John Calve</u>	Type of Search	Vendors and cost where applicable
Searcher Phone #: _____	NA Sequence (#) <u>350</u>	STN <u>11</u>
Searcher Location: _____	AA Sequence (#) _____	Dialog _____
Date Searcher Picked Up: <u>1/2/02</u>	Structure (#) <u>1</u>	Questel/Orbit _____
Date Completed: <u>1/2/02</u>	Bibliographic _____	Dr. Link _____
Searcher Prep & Review Time: <u>130 minutes</u>	Litigation _____	Lexis/Nexis _____
Clerical Prep Time: _____	Fulltext _____	Sequence Systems _____
Online Time: <u>60 min</u>	Patent Family _____	WWW/Internet _____
	Other _____	Other (specify) _____

# EIC1700

## Search Results

### Feedback Form (Optional)



Scientific & Technical Information Center

The search results generated for your recent request are attached. If you have any questions or comments (compliments or complaints) about the scope or the results of the search, please contact *the EIC searcher* who conducted the search *or contact*:

Kathleen Fuller, Team Leader, 308-4290, CP3/4 3D62

#### Voluntary Results Feedback Form

➤ I am an examiner in Workgroup:

Example: 1713

➤ Relevant prior art found, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art not found:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Search results were not useful in determining patentability or understanding the invention.

Other Comments:

Drop off completed forms in CP3/4 - 3D62 .

This is authors record.

Thompson

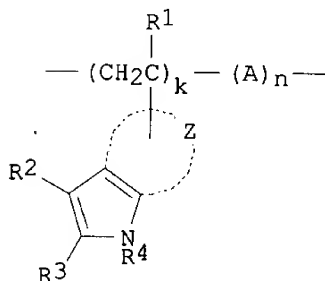
09/965,818

01/02/2003

L1 ANSWER 1 OF 1 HCA COPYRIGHT 2003 ACS  
AN 136:301533 HCA  
TI Organic luminescent material and device  
IN Taguchi, Toshiki  
PA Fuji Photo Film Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 19 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM C09K011-06  
ICS C08F026-00; H05B033-14; H05B033-22  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002105445	A2	20020410	JP 2000-300716	20000929
	US 2002041979	A1	20020411	US 2001-965818	20011001 <--
PRAI	JP 2000-300716	A	20000929		
GI					



AB The invention refers to an org. luminescent material I [R1 = H or methyl; R2-3 = H or substituents which may be joined to form a ring; R4 = H, (un)substituted alkyl, alkenyl, alkynyl, aryl, heterocyclyl, alkylcarbonyl, arylcarbonyl, alkylsulfonyl, arylsulfonyl, alkoxy carbonyl, aryloxy carbonyl, carbamoyl or sulfamoyl; Z = moiety comprising an arom. ring; A = copolymerizable monomer unit; k = 1 - 100; n = 0 - 9; k + n = 100].

ST luminescent electroluminescent material polymer  
IT Luminescent substances  
(electroluminescent; org. luminescent material and device)  
IT Luminescent substances  
(org. luminescent material and device)  
IT 852-38-0, PBD 25067-59-8, PVK 38215-36-0, Coumarin 6 94928-86-6  
155090-83-8, Baytron P 293749-61-8 407637-24-5 407637-37-0  
407637-39-2 407637-41-6 407637-43-8 407637-45-0  
RL: DEV (Device component use); USES (Uses)  
(org. luminescent material and device)  
IT 25569-45-3P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(org. luminescent material and device)

- IT 124-41-4, Sodium methoxide 1779-49-3, Methyltriphenyl phosphonium  
bromide 7570-45-8, N-Ethylcarbazole-3-carboxaldehyde  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(org. luminescent material and device)
- IT 1486-07-3P, N-Ethyl-3-vinylcarbazole  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(org. luminescent material and device)

=> file reg

FILE 'REGISTRY' ENTERED AT 13:29:43 ON 02 JAN 2003  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
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Property values tagged with IC are from the ZIC/VINITI data file  
provided by InfoChem.

STRUCTURE FILE UPDATES: 1 JAN 2003 HIGHEST RN 477930-11-3  
DICTIONARY FILE UPDATES: 1 JAN 2003 HIGHEST RN 477930-11-3

=> d his

(FILE 'HOME' ENTERED AT 08:31:57 ON 02 JAN 2003)

L1 FILE 'LREGISTRY' ENTERED AT 08:32:25 ON 02 JAN 2003  
STR

L2 FILE 'REGISTRY' ENTERED AT 08:38:09 ON 02 JAN 2003  
SCR 2043  
L3 5 S L1 AND L2

L4 FILE 'LREGISTRY' ENTERED AT 08:38:45 ON 02 JAN 2003  
STR L1

L5 FILE 'REGISTRY' ENTERED AT 08:47:09 ON 02 JAN 2003  
50 S L2 AND L4

FILE 'LREGISTRY' ENTERED AT 08:48:27 ON 02 JAN 2003

L6 FILE 'REGISTRY' ENTERED AT 08:57:10 ON 02 JAN 2003  
SCR 1842  
L7 50 S L4 AND L2 NOT L6

L8 FILE 'LREGISTRY' ENTERED AT 09:00:26 ON 02 JAN 2003  
STR  
L9 STR

L10 FILE 'REGISTRY' ENTERED AT 09:26:55 ON 02 JAN 2003  
SCR 970  
L11 SCR 1839  
L12 13 S L9 AND L2 AND L10 AND L11  
L13 1901 S L9 AND L2 AND L10 AND L11 FULL ← *parent*  
SAVE THOM818/A L13

L14 FILE 'LREGISTRY' ENTERED AT 09:39:46 ON 02 JAN 2003  
STR L8  
SAVE L14 THOMTEMP/L  
L15 STR  
L16 STR L14  
L17 STR L16  
L18 STR L17

FILE 'REGISTRY' ENTERED AT 12:05:46 ON 02 JAN 2003

L19 1 S L15 SSS SAM SUB=L13  
L20 44 S L15 SSS FULL SUB=L13 ← subset/substructure search of  
SAVE L20 THOM818A/A parent (L13)

FILE 'HCA' ENTERED AT 12:08:29 ON 02 JAN 2003

L21 55 S L20  
L22 5955 S L13 ← parent L13 / hits in CA file  
L23 542211 S EL OR E(W)L OR ELECTROLUM!N? OR ORGANOLUM!N? OR (ELECTRO OR O  
L24 97037 S EL OR E(W)L OR ELECTROLUM!N? OR ORGANOLUM!N? OR (ELECTRO OR O  
L25 897 S L22 AND L24  
L26 4 S L21 AND L24

FILE 'LREGISTRY' ENTERED AT 12:17:30 ON 02 JAN 2003  
L27 STR L17

FILE 'REGISTRY' ENTERED AT 12:26:01 ON 02 JAN 2003  
L28 33 S L27 SSS SAM SUB=L13  
L29 1900 S L13 NOT 25569-45-3  
L30 43 S L20 NOT 25569-45-3/RN

FILE 'HCA' ENTERED AT 12:47:59 ON 02 JAN 2003  
L31 44 S L30  
L32 38 S L28

FILE 'REGISTRY' ENTERED AT 12:54:53 ON 02 JAN 2003  
L33 SCR 140  
L34 29 S L9 AND L27 AND L33 AND L2 AND L10 AND L11 SSS SAM SUB=L13

FILE 'LREGISTRY' ENTERED AT 13:01:40 ON 02 JAN 2003  
L35 STR

FILE 'REGISTRY' ENTERED AT 13:08:35 ON 02 JAN 2003  
L36 2 S L35 AND L27 AND L33 AND L2 AND L10 AND L11 SSS SAM SUB=L13  
L37 STR L27  
L38 0 S L35 AND L37 AND L33 AND L2 AND L10 AND L11 SSS SAM SUB=L13  
L39 STR L35  
L40 0 S L39 AND L37 AND L33 AND L2 AND L10 AND L11 SSS SAM SUB=L13  
L41 7 S L39 AND L37 AND L33 AND L2 AND L10 AND L11 SSS FULL SUB=L13 ← subset search of L13  
SAVE L41 THOM818B/A

FILE 'HCA' ENTERED AT 13:20:47 ON 02 JAN 2003  
L42 7 S L41

FILE 'REGISTRY' ENTERED AT 13:21:31 ON 02 JAN 2003  
E IRIIDIUM/CN  
L43 1 S E3

FILE 'HCA' ENTERED AT 13:21:44 ON 02 JAN 2003  
L44 17883 S L43  
L45 44825 S L44 OR IRIIDIUM# OR IR(2A) (COMPLEX? OR COMPOUND? OR COMPD# OR  
L46 42 S L25 AND L45  
L47 0 S L41 AND L45  
L48 0 S L21 AND L45  
L49 0 S L31 AND L45  
S 25067-59-8/REG#

FILE 'REGISTRY' ENTERED AT 13:27:36 ON 02 JAN 2003  
L50 1 S 25067-59-8/RN

FILE 'HCA' ENTERED AT 13:27:36 ON 02 JAN 2003

L51 4346 S L50  
L52 1 S L46 NOT L51  
L53 10 S L26 OR L42  
L54 11 S L53 OR L52  
L55 34 S L31 NOT L54

FILE 'REGISTRY' ENTERED AT 13:29:43 ON 02 JAN 2003

=> d que stat L20

L2 SCR 2043

L9 STR

CH2=G1<sup>Hy</sup> C~CH3  
1 2 3 @7 8

*heterocyclic w/ 1 nitrogen\**

VAR G1=CH/7

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

GGCAT IS PCY UNS AT 3

DEFAULT ECLEVEL IS LIMITED

ECOUNT IS M1 N\*AT 3

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 5

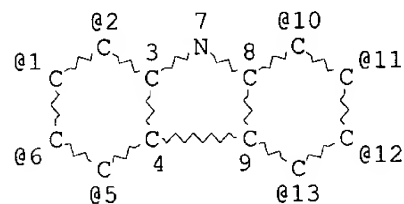
STEREO ATTRIBUTES: NONE

L10 SCR 970

L11 SCR 1839

L13 1901 SEA FILE=REGISTRY SSS FUL L9 AND L2 AND L10 AND L11

L15 STR



*← claim 21  
Cmpd.*

C=C  
@14 15

VPA 14-1/2/6/5/10/11/12/13 U

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

L20 44 SEA FILE=REGISTRY SUB=L13 SSS FUL L15

100.0% PROCESSED 986 ITERATIONS

44 ANSWERS

SEARCH TIME: 00.00.01

=&gt; d que stat L41

L2 SCR 2043

L9 STR

CH2=G1~Hy C~CH3  
1 2 3 @7 8

VAR G1=CH/7

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

GGCAT IS PCY UNS AT 3

DEFAULT ECLEVEL IS LIMITED

ECOUNT IS M1 N AT 3

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE

L10 SCR 970

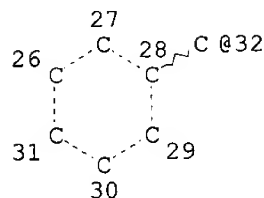
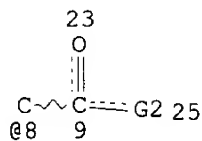
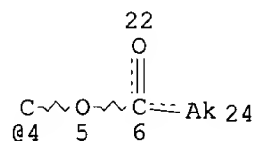
L11 SCR 1839

L13 1901 SEA FILE=REGISTRY SSS FUL L9 AND L2 AND L10 AND L11

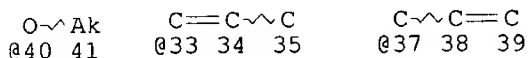
L33 SCR 140

L37 STR

C=G1  
1 21



Comonomer  
(A)



VAR G1=4/8/32/33/37

VAR G2=OH/NH2/40

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

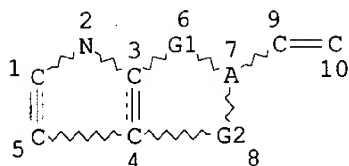
RSPEC 26

NUMBER OF NODES IS 26

STEREO ATTRIBUTES: NONE

L39 STR





REP G1=(0-3) A  
 REP G2=(0-3) A  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE  
 L41 7 SEA FILE=REGISTRY SUB=L13 SSS FUL L39 AND L37 AND L33 AND L2  
 AND L10 AND L11

100.0% PROCESSED 1108 ITERATIONS  
 SEARCH TIME: 00.00.01

7 ANSWERS

=> file hca

FILE 'HCA' ENTERED AT 13:31:44 ON 02 JAN 2003  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
 COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)

=> d L54 1-11 cbib abs hitstr hitind

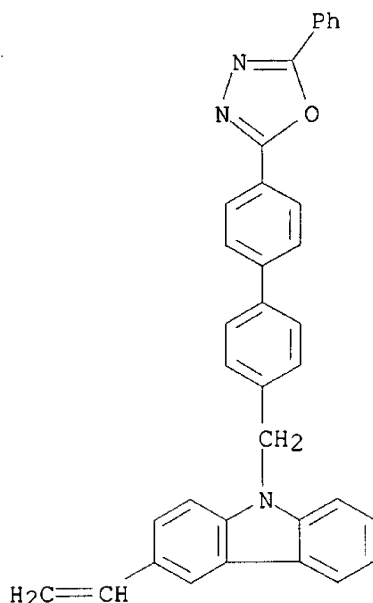
L54 ANSWER 1 OF 11 HCA COPYRIGHT 2003 ACS  
 137:301875 Novel polymer and its use in luminescent device. Taguchi, Toshiki  
 (Fuji Photo Film Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002302516  
 A2 20021018, 17 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
 2001-104580 20010403.  
 AB The polymer is represented by (Am)p-(Bn)q (A = monomer unit having both  
 hole-transporting structure and electron-transporting structure; B =  
 monomer unit having structure other than A; m .gtoreq. 1; n .gtoreq. 0; p,  
 q = molar fraction in %; p = 1-100; q = 0-99; p + q = 100). The device  
 has the polymer between electrodes, and preferably uses phosphors  
**emitting light** from triplet excited state. The polymer  
 gives the device with high luminance, **light-emitting**  
 efficiency, and durability.  
 IT **468066-06-0**  
 RL: DEV (Device component use); TEM (Technical or engineered material  
 use); USES (Uses)  
 (polymer having hole-transporting and electron transporting structure  
 for luminescent device)  
 RN 468066-06-0 HCA

CN 9H-Carbazole, 3-ethenyl-9-[[4'-(5-phenyl-1,3,4-oxadiazol-2-yl)[1,1'-biphenyl]-4-yl]methyl]-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 468066-05-9

CMF C35 H25 N3 O



IC ICM C08F012-32

ICS C08F012-26; C08F026-12; C09K011-06; H05B033-14

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 37

IT **Electroluminescent** devices  
Phosphors

(polymer having hole-transporting and electron transporting structure for luminescent device)

IT 468065-96-5 468065-98-7 468066-00-4 468066-02-6 468066-04-8  
**468066-06-0**

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

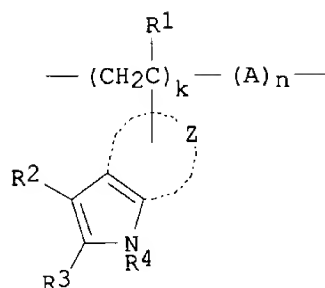
(polymer having hole-transporting and electron transporting structure for luminescent device)

L54 ANSWER 2 OF 11 HCA COPYRIGHT 2003 ACS

136:301533 Organic luminescent material and device. Taguchi, Toshiki (Fuji Photo Film Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002105445 A2 20020410, 19 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-300716 20000929.

GI

*Applicants'*



AB The invention refers to an **org. luminescent** material I  
 [R1 = H or methyl; R2-3 = H or substituents which may be joined to form a ring; R4 = H, (un)substituted alkyl, alkenyl, alkynyl, aryl, heterocyclyl, alkylcarbonyl, arylcarbonyl, alkylsulfonyl, arylsulfonyl, alkoxy carbonyl, aryloxy carbonyl, carbamoyl or sulfamoyl; Z = moiety comprising an arom. ring; A = copolymerizable monomer unit; k = 1 - 100; n = 0 - 9; k + n = 100].

IT 293749-61-8 407637-24-5 407637-37-0

407637-39-2 407637-41-6 407637-43-8

RL: DEV (Device component use); USES (Uses)

(**org. luminescent** material and device)

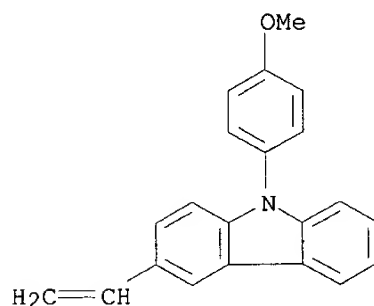
RN 293749-61-8 HCA

CN 9H-Carbazole, 3-ethenyl-9-(4-methoxyphenyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 293749-60-7

CMF C21 H17 N O



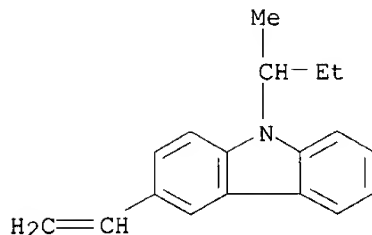
RN 407637-24-5 HCA

CN 9H-Carbazole, 3-ethenyl-9-(1-methylpropyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 407637-23-4

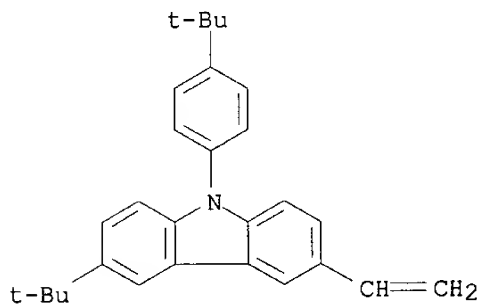
CMF C18 H19 N



RN 407637-37-0 HCA  
CN 9H-Carbazole, 3-(1,1-dimethylethyl)-9-[4-(1,1-dimethylethyl)phenyl]-6-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

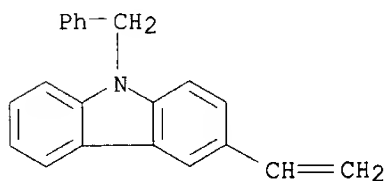
CRN 407637-36-9  
CMF C28 H31 N



RN 407637-39-2 HCA  
CN 9H-Carbazole, 3-ethenyl-9-(phenylmethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

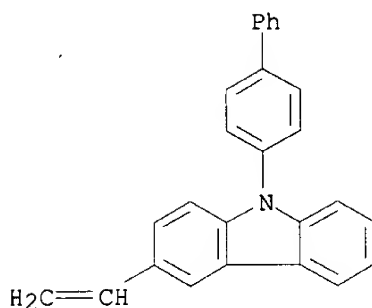
CRN 407637-38-1  
CMF C21 H17 N



RN 407637-41-6 HCA  
CN 9H-Carbazole, 9-[1,1'-biphenyl]-4-yl-3-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

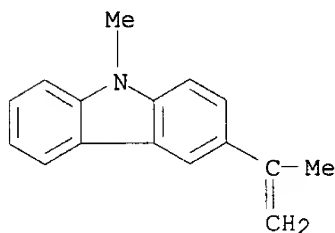
CRN 407637-40-5  
CMF C26 H19 N



RN 407637-43-8 HCA  
CN 9H-Carbazole, 9-methyl-3-(1-methylethenyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

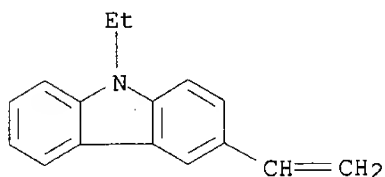
CRN 407637-42-7  
CMF C16 H15 N



IT 25569-45-3P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(org. luminescent material and device)  
RN 25569-45-3 HCA  
CN 9H-Carbazole, 3-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1486-07-3  
CMF C16 H15 N



IC ICM C09K011-06  
ICS C08F026-00; H05B033-14; H05B033-22  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
ST luminescent **electroluminescent** material polymer

IT **Luminescent** substances  
(**electroluminescent**; **org. luminescent**  
material and device)

IT **Luminescent** substances  
(**org. luminescent** material and device)

IT 852-38-0, PBD 25067-59-8, PVK 38215-36-0, Coumarin 6 94928-86-6  
155090-83-8, Baytron P 293749-61-8 407637-24-5  
407637-37-0 407637-39-2 407637-41-6  
407637-43-8 407637-45-0  
RL: DEV (Device component use); USES (Uses)  
(**org. luminescent** material and device)

IT 25569-45-3P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(**org. luminescent** material and device)

IT 124-41-4, Sodium methoxide 1779-49-3, Methyltriphenyl phosphonium  
bromide 7570-45-8, N-Ethylcarbazole-3-carboxaldehyde  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**org. luminescent** material and device)

IT 1486-07-3P, N-Ethyl-3-vinylcarbazole  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(**org. luminescent** material and device)

L54 ANSWER 3 OF 11 HCA COPYRIGHT 2003 ACS  
135:358504 Phosphorescent copolymer of IR-bound 2-(4-vinylphenyl)pyridine with  
N-vinylcarbazole. Lee, Jae-Suk; Kang, Nam-Goo; Cho, Young-Sun; Ahn,  
Jun-Hwan; Lee, Chang-Lyoul; Kim, Jang-Joo (Department of Materials Science  
and Engineering, Kwangju Institute of Science and Technology (K-JIST),  
Kwangju, 500-712, S. Korea). Polymer Preprints (American Chemical  
Society, Division of Polymer Chemistry), 42(2), 448-449 (English) 2001.  
CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society,  
Division of Polymer Chemistry.

AB Poly(2-(4-vinylphenyl)pyridine-co-vinylcarbazole) and **complexed**  
with Ir(III) acetylacetonate were synthesized for the  
application of **light emitting diode (LED)**. From  
UV/visible and photoluminescence spectra of **Ir complex**  
copolymer in 1,2-dichloroethane solns., the intermol. energy transfer was  
not obsd. Intermol. energy transfer was obsd., however, at 510 nm in  
photoluminescence spectra of **Ir complex** copolymer in  
film state. This suggests that the excimer of PVK in **Ir**  
**complex** copolymer could be effect on the intermol. energy  
transfer. Single and multilayer device of **Ir complex**  
copolymer was fabricated to confirm the energy transfer mechanism.

IT 7439-88-5DP, **Iridium**, complexes with  
vinylcarbazole-(vinylphenyl)pyridine copolymer, preparation  
372946-79-7DP, N-Vinylcarbazole-2-(4-vinylphenyl)pyridine  
copolymer, **iridium** complexes  
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(prepn. and application in LED)

RN 7439-88-5 HCA  
CN Iridium (8CI, 9CI) (CA INDEX NAME)

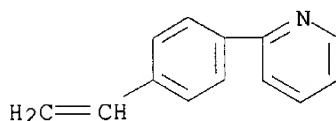
Ir

RN 372946-79-7 HCA  
CN 9H-Carbazole, 9-ethenyl-, polymer with 2-(4-ethenylphenyl)pyridine (9CI)  
(CA INDEX NAME)

CM 1

CRN 69135-05-3

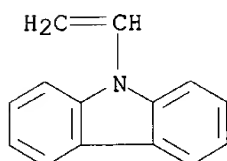
CMF C13 H11 N



CM 2

CRN 1484-13-5

CMF C14 H11 N



CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 38, 73

ST vinylphenylpyridine vinylcarbazole copolymer **iridium** complex  
phosphorescent; LED vinylphenylpyridine vinylcarbazole copolymer  
**iridium** complex

IT Luminescence

Luminescence, **electroluminescence**

UV and visible spectra

(of vinylcarbazole-(vinylphenyl)pyridine copolymer-**iridium**  
complex)IT **Electroluminescent** devices(vinylcarbazole-(vinylphenyl)pyridine copolymer-**iridium**  
complex for)IT **7439-88-5DP, Iridium**, complexes with  
vinylcarbazole-(vinylphenyl)pyridine copolymer, preparation  
**372946-79-7DP, N-Vinylcarbazole-2-(4-vinylphenyl)pyridine**  
copolymer, **iridium** complexesRL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(prepn. and application in LED)

L54 ANSWER 4 OF 11 HCA COPYRIGHT 2003 ACS

126:344111 Synthesis and characterization of fluorescent side-chain polymers.  
Lee, Seung Ju; Kim, Dong Wook; Park, Soo Young; Hong, Sung Il (Department  
of Fiber and Polymer Science, Seoul National University, Seoul, 151-742,  
S. Korea). Korea Polymer Journal, 5(1), 52-56 (English) 1997. CODEN:  
KPJOE2. Publisher: Polymer Society of Korea.AB Two methacrylate monomers contg. highly fluorescent phenylene vinylene and  
carbazolylene vinylene moieties were synthesized. Fluorescent side-chain  
polymers with potential **electroluminescent** device application  
were obtained by copolymn. of these monomers with Me methacrylate (MMA) or  
9-vinylcarbazole (NVK) using a free radical initiator. Since the polymers  
were very sol. in common org. solvents, polymeric films could be prepd. by

spin coating or casting. The mol. wt. of the polymers was as high as 40,000 g/mol and the glass transition temp. varied from 120.degree. to above 200.degree., depending on the chem. structure of the polymers. The phenylene vinylene-based polymers showed greenish-blue emission (around 485 nm) and the carbazolyene vinylene-based polymers blue emission (around 445 nm).

IT 189949-58-4P

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(prepn. and characterization of fluorescent side-chain polymers)

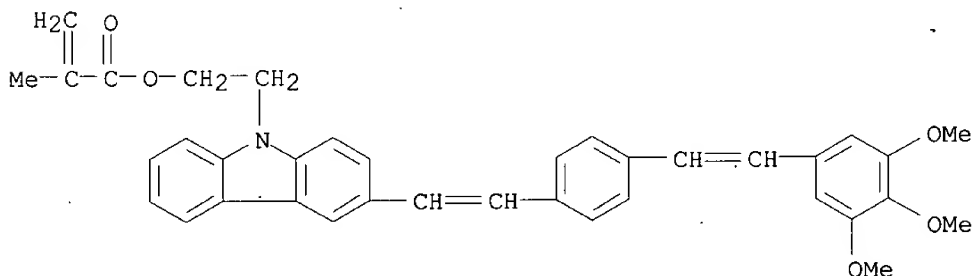
RN 189949-58-4 HCA

CN 2-Propenoic acid, 2-methyl-, 2-[3-[2-[4-[2-(3,4,5-trimethoxyphenyl)ethenyl]phenyl]ethenyl]-9H-carbazol-9-yl]ethyl ester, polymer with 9-ethenyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 189949-54-0

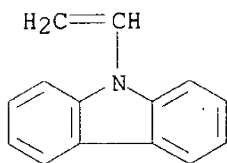
CMF C37 H35 N O5



CM 2

CRN 1484-13-5

CMF C14 H11 N



CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 73

IT 189949-55-1P 189949-56-2P 189949-57-3P 189949-58-4P

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(prepn. and characterization of fluorescent side-chain polymers)

154 ANSWER 5 OF 11 HCA COPYRIGHT 2003 ACS

120:230371 **Electroluminescence** from single layer molecularly doped polymer films. Johnson, G. E.; McGrane, K. M. (Webster Res. Cent., Xerox Corp., Webster, NY, 14580, USA). Proceedings of SPIE-The International Society for Optical Engineering, 1910(Electroluminescent Materials, Devices, and Large-Screen Displays), 6-14 (English) 1993. CODEN: PSISDG. ISSN: 0277-786X.



AB **Electroluminescence** from single layer devices comprised of a solid state soln. of an electron transport small mol. and an emitter mol. dispersed in poly(N-vinylcarbazole) is described. The use of molecularly doped polymers as the materials package and the single layer nature of these devices simplifies their fabrication by enabling spin coating techniques to be used. The color of the **electroluminescence** from these devices can be tuned across the visible spectrum by appropriate selection of the emitter mol. The use of molecularly doped polymers allows tailoring of the transport properties of the device. Incorporation of a hole transport small mol. in the polymer based film enables tuning of the mobility of the carriers injected into the device from the ITO anode. Whereas the luminance from any given device increases linearly with the injected c.d. the luminance obsd. from different devices is independent of the hole mobility. The crit. determinant for the level of light output is the no. of carriers injected into the device; how fast they move is unimportant.

IT **55447-32-0**, Poly(3-vinylcarbazole)

RL: PRP (Properties)

(**electroluminescent** device from molecularly doped films of)

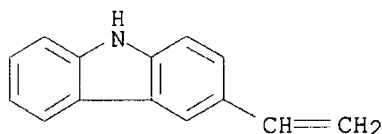
RN 55447-32-0 HCA

CN 9H-Carbazole, 3-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 55447-31-9

CMF C14 H11 N



CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 36, 76

ST **electroluminescence** mol doped polymer; **luminescence**  
**electro** mol doped polymer; **light emitting**  
device doped polymer

IT Polymers, uses

RL: USES (Uses)

(**electroluminescent** devices from molecularly doped)

IT **Electroluminescent** devices

(from molecularly doped films)

IT **Luminescence, electro-**

Ultraviolet and visible spectra

(of molecularly doped polymer films)

IT **55447-32-0**, Poly(3-vinylcarbazole).

RL: PRP (Properties)

(**electroluminescent** device from molecularly doped films of)

IT 989-38-8 15082-28-7 38215-36-0, Coumarin 6 50926-11-9, Indium tin  
oxide 65181-78-4

RL: PRP (Properties)

(in **electroluminescent** device)

L54 ANSWER 6 OF 11 HCA COPYRIGHT 2003 ACS

101:120409 Photosensitive plate for electrophotography. (Tomoegawa Paper Mfg.  
Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 58097053 A2 19830609 Showa,  
10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1981-194558 19811204.

AB In a photosensitive plate for electrophotog. in which a photosensitive layer contg. at least ZnO and a carbazole group-contg. compd. is formed on an electroconductive support, the carbazole group-contg. compd. is a copolymer of a monomer contg. a carbazole group (e.g. N-vinylcarbazole) and a monomer not contg. a carbazole group selected from esters of acrylic or methacrylic acid, vinyl esters of org. acids, styrene, styrene derivs., N-vinyl-2-pyrrolidone, etc.

IT **91838-98-1**

RL: USES (Uses)

(electrophotog. photoconductive layer contg. zinc oxide and)

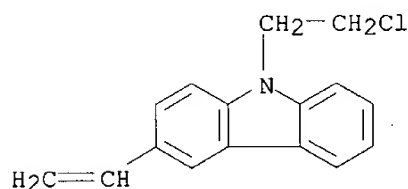
RN 91838-98-1 HCA

CN 2-Propenoic acid, 2-methyl-, butyl ester, polymer with  
9-(2-chloroethyl)-3-ethenyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 91838-97-0

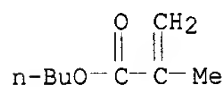
CMF C16 H14 Cl N



CM 2

CRN 97-88-1

CMF C8 H14 O2



IC G03G005-07; G03G005-04

CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 26710-15-6 27967-83-5 30112-03-9 62599-73-9 62599-75-1

69941-65-7 91838-95-8 91838-96-9 **91838-98-1** 91838-99-2

91839-00-8 91839-01-9 91839-02-0 91839-03-1 91839-04-2

91867-95-7

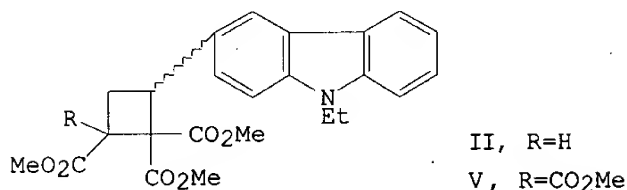
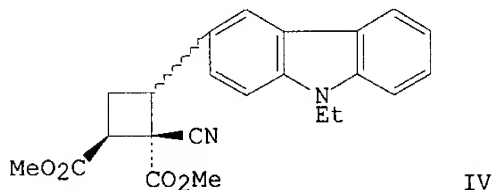
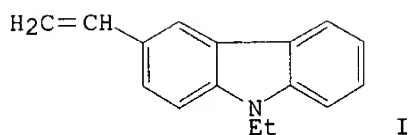
RL: USES (Uses)

(electrophotog. photoconductive layer contg. zinc oxide and)

L54 ANSWER 7 OF 11 HCA COPYRIGHT 2003 ACS

96:52123 Cycloaddition and polymerization reactions of N-ethyl-3-vinylcarbazole with electron-poor olefins. Abdelkader, M.; Hall, H. K., Jr. (Chem. Dep., Univ. Arizona, Tucson, AZ, 85721, USA). Journal of Organic Chemistry, 47(2), 292-5 (English) 1982. CODEN: JOCEAH. ISSN: 0022-3263.

GI



AB The reaction of N-ethyl-3-vinylcarbazole (I) and tri-Me ethylenetricarboxylate yielded II and homopoly(N-ethyl-3-vinylcarbazole) (III). The formation of II was favored by polar solvents and high temps. Formation of III was suppressed by Me<sub>2</sub>SO but unaffected by the addn. of radical inhibitors. With AIBN as initiator, an alternating copolymer was obtained (as well as some II). Di-Me cyanofumarate reacted with I at room temp. to yield IV and III. Reaction of I with tetra-Me ethylenetetracarboxylate at high temp. gave V. These reactions were interpreted as proceeding via predominantly zwitterionic tetramethylene intermediates.

IT **79917-26-3P**

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

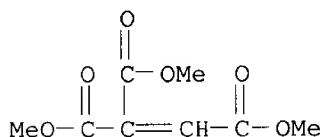
RN 79917-26-3 HCA

CN Ethenetricarboxylic acid, trimethyl ester, polymer with  
3-ethenyl-9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 51175-48-5

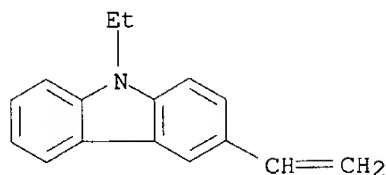
CMF C8 H10 O6



CM 2

CRN 1486-07-3

CMF C16 H15 N



CC 27-11 (Heterocyclic Compounds (One Hetero Atom))  
 IT 1733-15-9P 25569-45-3P 79917-22-9P 79917-23-0P 79917-24-1P  
 79917-25-2P **79917-26-3P** 79980-56-6P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)

L54 ANSWER 8 OF 11 HCA COPYRIGHT 2003 ACS

88:137328 Donor-acceptor interaction of poly(N-methyl-3-vinylcarbazole).  
 Furue, Masaoki; Nakajima, Kaoru; Saeki, Masao; Nozakura, Shunichi (Fac.  
 Sci., Osaka Univ., Toyonaka, Japan). Polymer Journal (Tokyo, Japan),  
 10(1), 13-18 (English) 1978. CODEN: POLJB8. ISSN: 0032-3896.

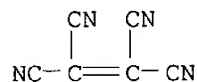
AB The formation of charge-transfer complexes of poly(N-methyl-3-vinylcarbazole) (I) with tetracyanoethylene, 2,4,5,7-tetranitro-9-fluorenone, chloranil, and 1,3,5-trinitrobenzene was studied spectrophotometrically. The assocn. consts. for I complexes were 2.5-7.1 times larger than those for the corresponding monomeric analog, N-methyl-3-ethylcarbazole. Complexes of the dimer model, 1,3-bis[3-(N-methylcarbazolyl)]propane were less stable than those of the monomeric N-methyl-3-ethylcarbazole and of I. The larger stabilities in the polymer system resulted from the local concn. effect and from the favorable arrangements of the neighboring carbazole units.

IT **66056-15-3P**  
 RL: PREP (Preparation)  
 (thermodn. parameters in formation of)

RN 66056-15-3 HCA  
 CN Ethenetetracarbonitrile, compd. with ethenylbenzene polymer with  
 3-ethenyl-9-methyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 670-54-2  
 CMF C6 N4

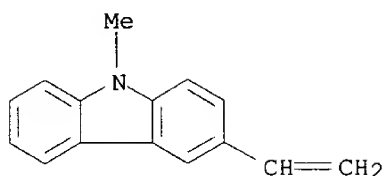


CM 2

CRN 32369-24-7  
 CMF (C15 H13 N . C8 H8)x  
 CCI PMS

CM 3

CRN 1486-08-4  
 CMF C15 H13 N



CM 4

CRN 100-42-5

CMF C8 H8

H<sub>2</sub>C=CH-Ph

CC 36-6 (Plastics Manufacture and Processing)

IT **66056-15-3P**RL: PREP (Preparation)  
(thermodn. parameters in formation of)L54 ANSWER 9 OF 11 HCA COPYRIGHT 2003 ACS

83:115031 Anionic polymerization on N-ethyl-2-vinylcarbazole and N-ethyl-3-vinylcarbazole. Limburg, W. W.; Yanus, J. F.; Williams, D. J.; Goedde, A. O.; Pearson, J. M. (Res. Lab., Xerox Corp., Webster, NY, USA). Journal of Polymer Science, Polymer Chemistry Edition, 13(5), 1133-9 (English) 1975. CODEN: JPLCAT. ISSN: 0449-296X.

GI For diagram(s), see printed CA Issue.

AB N-ethyl-2-vinylcarbazole (I) [38627-52-0] and N-ethyl-3-vinylcarbazole (II) [1486-07-3] were prepd. and polymd. anionically; the polymn. was followed by uv and visible spectroscopy and the spectral consts. were calcd. for the propagating carbanions. I polymer had all the features of a standard living polymer; the carbanion was stable at ambient temps. and high mol. wt., narrow distribution polymers and block polymers [56166-19-9] with styrene were prepd. The carbanion from II was much less stable and a clean polymn. could only be conducted at temps. <-60.degree.. The anionic polymn. of I and II was compared to that of N-vinylcarbazole. I was prepd. from N-ethyl-2-carbazolecarboxaldehyde (III) [56166-62-2] by a Wittig reaction. III was obtained from N-ethyl-2-bromocarbazole [56166-63-3], which was obtained by N-alkylating 2-bromocarbazole.

IT **56166-19-9P**RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of block)

RN 56166-19-9 HCA

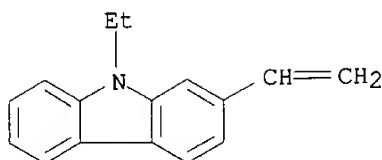
CN 9H-Carbazole, 2-ethenyl-9-ethyl-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N

on  
claim  
18



CM 2

CRN 100-42-5

CMF C8 H8

 $\text{H}_2\text{C}=\text{CH}-\text{Ph}$ CC 35-4 (Synthetic High Polymers)  
Section cross-reference(s): 27, 73IT **56166-19-9P**RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of block)

L54 ANSWER 10 OF 11 HCA COPYRIGHT 2003 ACS

78:84912 Determination of reactivity ratios of 3-vinyl-9-ethylcarbazole with styrene. Grosheva, M. P.; Sirotkina, E. E. (USSR). Uch. Zap., Mosk. Gos. Pedagog. Inst., No. 411, 169-75 From: Ref. Zh., Khim 1972, Abstr. No. 12S187 (Russian) 1971.

AB Bulk polymn. in the presence of azodiisobutyronitrile [78-67-1] gave styrene-3-vinyl-9-ethylcarbazole copolymer [32369-23-6] without monomer azeotrope formation. The reactivity ratio for styrene was 0.115  $\pm$  0.05, and for the carbazole, 1.27  $\pm$  0.125.

CC 35-4 (Synthetic High Polymers)

L54 ANSWER 11 OF 11 HCA COPYRIGHT 2003 ACS

75:64684 Chemistry of carbazole derivatives. 57. Synthesis of anion exchangers based on a copolymer of styrene with 3-vinyl-9-alkylcarbazoles. Lopatinskii, V. P.; Sirotkina, E. E.; Grosheva, M. P.; Sizova, L. S. (USSR). Izvestiya Tomskogo Politekhnikheskogo Instituta, 185, 106-11 (Russian) 1970. CODEN: ITPKAM. ISSN: 0368-0487.

AB Chloromethylation of 3-vinyl-9-ethylcarbazole-styrene copolymer and 3-vinyl-9-methylcarbazole-styrene copolymer was most effective using 10:1 monochlorodimethyl ether-copolymer at 60.degree. for 1 hr in the presence of 50% ZnCl<sub>2</sub> based on copolymer wt.; the degree of crosslinking increased with the carbazole content of the copolymer. amination of the chloromethylated copolymer with 36% aq. Me<sub>3</sub>N gave crosslinked anion exchangers with an exchange capacity of 3.6-3.8 mg-equiv./g.IT **32369-23-6**, uses and miscellaneous **32369-24-7**, uses and miscellaneous

RL: USES (Uses)

(chloromethylated, quaternized, anion exchangers from)

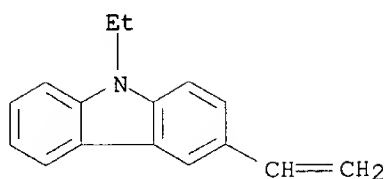
RN 32369-23-6 HCA

CN 9H-Carbazole, 3-ethenyl-9-ethyl-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 1486-07-3

CMF C16 H15 N



CM 2

CRN 100-42-5

CMF C8 H8

 $\text{H}_2\text{C}=\text{CH}-\text{Ph}$ 

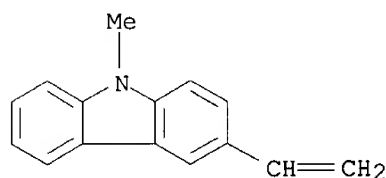
RN 32369-24-7 HCA

CN Carbazole, 9-methyl-3-vinyl-, polymer with styrene (8CI) (CA INDEX NAME)

CM 1

CRN 1486-08-4

CMF C15 H13 N



CM 2

CRN 100-42-5

CMF C8 H8

 $\text{H}_2\text{C}=\text{CH}-\text{Ph}$ 

CC 36 (Plastics Manufacture and Processing)

IT 32369-23-6, uses and miscellaneous 32369-24-7, uses and miscellaneous

RL: USES (Uses)

(chloromethylated, quaternized, anion exchangers from)

=&gt; d L55 1-34 cbib abs hitstr hitind

L55 ANSWER 1 OF 34 HCA COPYRIGHT 2003 ACS

133:238477 N-Phenylvinylcarbazole compounds as radical polymerization monomers for polymers and their manufacture. Nakaya, Tadao; Yamauchi, Takao (Taiho Kogyo Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000256319 A2 20000919, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-65200 19990311.

AB Carbazole compds. which bear a vinyl group on the 4 position and a substituted Ph group on the 1 position are prepd. by alkylating carbazole (I) with a substituted Ph iodide compd., then formylating the alkylated I with a Vilmeier reagent and converting the formylated compd. to a vinyl compd.

IT **293749-61-8P**

RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)  
(phenylvinylcarbazole compds. as radical polymn. monomers for polymers and manuf.)

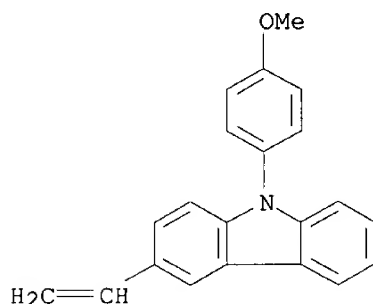
RN 293749-61-8 HCA

CN 9H-Carbazole, 3-ethenyl-9-(4-methoxyphenyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 293749-60-7

CMF C21 H17 N O



IC ICM C07D209-86

ICS C08F126-12

CC 35-2 (Chemistry of Synthetic High Polymers)

IT **293749-61-8P**

RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)  
(phenylvinylcarbazole compds. as radical polymn. monomers for polymers and manuf.)

L55 ANSWER 2 OF 34 HCA COPYRIGHT 2003 ACS

130:183337 Advanced organic materials for optoelectronic integrated devices, interconnects, and packaging. Sandalphon; Hendrickx, E.; Herlocker, J.; Jabbour, G. E.; Kawabe, Y.; Kippelen, B.; Morrell, M. M.; Shaheen, S. E.; Steele, D. D.; Wang, J. F.; Peyghambarian, N. (Optical Sciences Center, University of Arizona, Tucson, AZ, 85721, USA). Science and Technology of Polymers and Advanced Materials: Emerging Technologies and Business Opportunities, [Proceedings of the International Conference on Frontiers of Polymers and Advanced Materials], 4th, Cairo, Jan. 4-9, 1997, Meeting Date 1997, 375-384. Editor(s): Prasad, Paras N. Plenum: New York, N. Y. (English) 1998. CODEN: 67CCA5.

AB The progress made in understanding the chem. and material science aspects of the shelf-life of photorefractive materials is reviewed with 16 refs. Photorefractive polymer processing and transillumination imaging using photorefractive polymers are also reviewed.

IT **55447-28-4**, Poly(2-vinylcarbazole)

RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

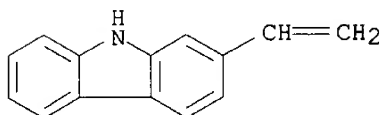
(advanced org. materials for optoelectronic integrated devices, interconnects, and packaging)



RN 55447-28-4 HCA  
CN 9H-Carbazole, 2-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 40911-19-1  
CMF C14 H11 N



CC 38-0 (Plastics Fabrication and Uses)

Section cross-reference(s): 73, 74

IT **55447-28-4**, Poly(2-vinylcarbazole)

RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(advanced org. materials for optoelectronic integrated devices, interconnects, and packaging)

L55 ANSWER 3 OF 34 HCA COPYRIGHT 2003 ACS

119:204416 Electrochromic films of vinylcarbazole derivatives. Geissler, Uwe; Hallensleben, Manfred L.; Toppare, Levent (Inst. Makromol. Chem., Univ. Hannover, Hannover, D-W-3000, Germany). Synthetic Metals, 55(2-3), 1662-7 (English) 1993. CODEN: SYMEDZ. ISSN: 0379-6779.

AB Several vinylcarbazole derivs. were electrochem. polymd. into electrochromic films with elec. conductivities at 10<sup>-4</sup>-10<sup>-7</sup> S/cm. The characteristic white/green color change upon doping was due to bicarbazolyl groups. The cyclic voltammograms of the monomers revealed small difference due to the various positions of the vinyl group in the ring.

IT **41008-78-0P**, Poly(9-ethyl-2-vinylcarbazole)

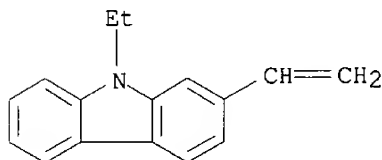
RL: SPN (Synthetic preparation); PREP (Preparation)  
(electrochromic, prepn. and properties of)

RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0  
CMF C16 H15 N



CC 37-3 (Plastics Manufacture and Processing)

IT 25067-59-8P, Poly(9-vinylcarbazole) 25569-45-3P, Poly(9-ethyl-3-vinylcarbazole) **41008-78-0P**, Poly(9-ethyl-2-vinylcarbazole)

RL: SPN (Synthetic preparation); PREP (Preparation)  
(electrochromic, prepn. and properties of)

L55 ANSWER 4 OF 34 HCA COPYRIGHT 2003 ACS

111:215228 Improved hole drift mobility in excimer-free polymers containing a dimeric carbazole unit. Sasakawa, Tomoyoshi; Ikeda, Tomiki; Tazuke, Shigeo (Res. Lab. Resour. Util., Tokyo Inst. Technol., Yokohama, 227, Japan). *Macromolecules*, 22(11), 4253-9 (English) 1989. CODEN: MAMOBX. ISSN: 0024-9297.

AB The hole drift mobility of vinyl polymers contg. 1,2-trans-bis(9H-carbazol-9-yl)cyclobutane (I) pendant groups was >10 times that of poly(9-vinylcarbazole) or poly(9-ethyl-3-vinylcarbazole). Comparison of their photophys. properties indicated that the high hole drift mobility of I-contg. polymers was due to the redn. of the concn. of trapping sites (excimer-forming sites). This was conformed by the temp. and elec. field dependence of the mobility.

IT 80218-51-5 80218-52-6

RL: PRP (Properties)

(hole drift mobility in, photophys. properties in relation to)

RN 80218-51-5 HCA

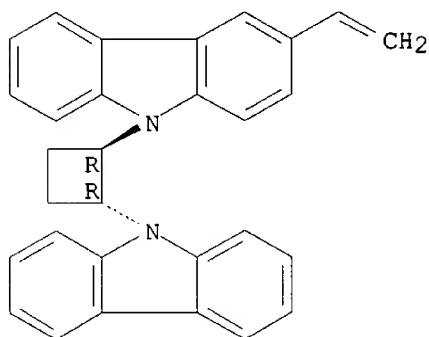
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

Relative stereochemistry.



RN 80218-52-6 HCA

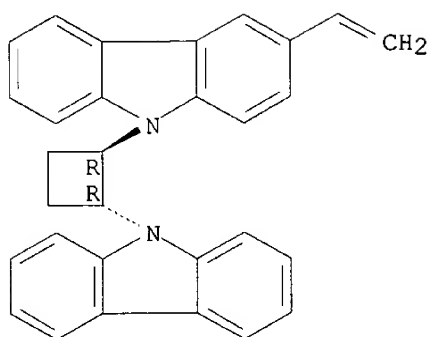
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-, polymer with 3-ethenyl-9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

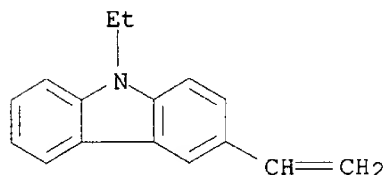
Relative stereochemistry.



CM 2

CRN 1486-07-3

CMF C16 H15 N



CC 36-5 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 74, 76

IT 25067-59-8 25569-45-3 80218-51-5 80218-52-6

RL: PRP (Properties)

(hole drift mobility in, photophys. properties in relation to)

L55 ANSWER 5 OF 34 HCA COPYRIGHT 2003 ACS

108:213729 The effect of quasielectric field of variable zone layers on efficiency of injection sensitization of the organic semiconductors. Ryannel, E. F.; Kaplinskaya, L. V.; Mikubaeva, E. V. (Inst. Khim. Neft., Tomsk, USSR). Zhurnal Nauchnoi i Prikladnoi Fotografii i Kinematografii, 33(2), 105-10 (Russian) 1988. CODEN: ZNPFAG. ISSN: 0044-4561.

AB The effect was studied of quasielec. field (E) of variable zone Sel-xTex injection layers, on efficiency of injection sensitization of the org. semiconductors including poly(N-vinylcarbazole), poly(N-butenylcarbazole), and diphenylhydrazone. E (Depending on the direction and magnitude of the internal field E<sub>0</sub> of the surface charge) was able to change spectral range of photosensitivity, the residual potential value, and a dependence of photosensitivity on the surface potential. Also E<sub>0</sub> was not uniform across thickness of the transparent org. semiconductor layer.

IT 55447-28-4

RL: USES (Uses)

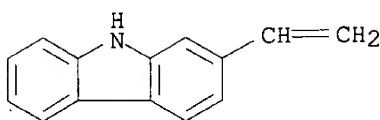
(electrophotog. photoconductor contg., effect of quasielec. field of variable zone selenium-tellurium injection layers on efficiency of sensitization of)

RN 55447-28-4 HCA

CN 9H-Carbazole, 2-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

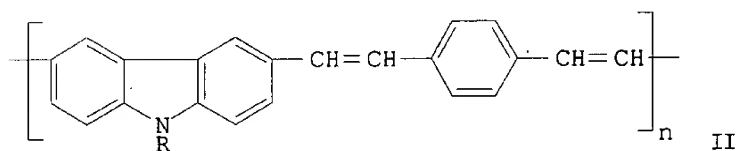
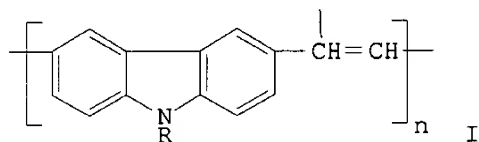
CRN 40911-19-1  
CMF C14 H11 N



CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
IT 588-64-7, Diphenylhydrazone 55447-28-4 114571-70-9  
RL: USES (Uses)  
(electrophotog. photoconductor contg., effect of quasialec. field of variable zone selenium-tellurium injection layers on efficiency of sensitization of)

L55 ANSWER 6 OF 34 HCA COPYRIGHT 2003 ACS  
104:6698 Polymer electric conductors. Kawahara, Hiroshi; Otsuka, Iwahiro; Kayame, Kiyoteru; Yamada, Yutaka (Asahi Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 60156745 A2 19850816 Showa, 6 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1984-12002 19840127.

GI



AB Elec. conductive comps. comprise a poly(arylene vinylene) having structural unit I or II (R = H, C1-16 alkyl, n = integer) and an electron acceptor. Thus, cylindrical pellets made from I (R = Et) [99527-66-9] and 159% I2 had elec. cond. 2 .times. 10<sup>-5</sup> S/cm compared with 5 .times. 10<sup>-13</sup> S/cm for a pellet contg. no I2.

IT 99538-14-4

RL: USES (Uses)

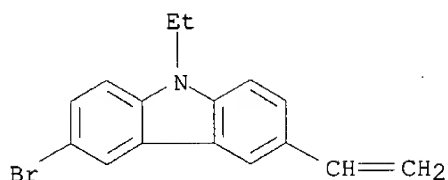
(elec. conductive comps., contg. electron acceptors)

RN 99538-14-4 HCA

CN 9H-Carbazole, 3-bromo-6-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 80190-98-3  
CMF C16 H14 Br N



IC ICM C08L065-00  
CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 76  
IT 99527-64-7 99527-65-8 99527-66-9 **99538-14-4**  
RL: USES (Uses)  
(elec. conductive compns., contg. electron acceptors)

L55 ANSWER 7 OF 34 HCA COPYRIGHT 2003 ACS

103:186798 Xerographic study of neat polymers containing trans-1,2-bis(9-carbazolyl)cyclobutane units. Tazuke, Shigeo; Inoue, Takashi; Kokado, Hiroshi (Res. Lab. Resour. Util., Tokyo Inst. Technol., Yokohama, 227, Japan). Polymer Photochemistry, 6(5), 385-92 (English) 1985. CODEN: POPHDO. ISSN: 0144-2880.

AB Photocond. of the following unsensitized polymers was evaluated by xerog. methods and discussed with ref. to the polymer structures: poly(9-vinylcarbazole) (I), poly(9-ethyl-3-vinylcarbazole) (II), poly[trans-1-(3-vinyl-9-carbazolyl)-2-(9-carbazolyl)-cyclobutane] (III), copolymers of II and III [content of II: 91% (IV), 34% (V)] and poly[trans-1-(3-acryloyloxymethyl-9-carbazolyl)-2-(9-carbazolyl)cyclobutane] (VI). The initial charge decay rate under photoirradn. and the half-lifetime were in the order  $V > I > III > II > VI > IV$  and  $V < III < VI < I < II < IV$ , resp. The excimer intensity increased in the order  $VI, III < V < IV < II \ll I$ . The biscarbazolylcyclobutane unit scarcely formed excimer, and the local chromophore concn. was high. These factors were favorable for both carrier generation and carrier transport. Other factors necessary for a good photoconductor are also discussed.

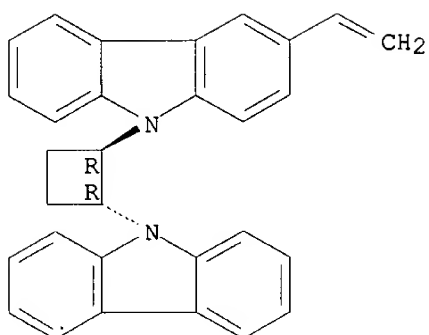
IT **80218-51-5 80218-52-6**  
RL: USES (Uses)  
(photocond. of unsensitized, for electrophotog.)

RN 80218-51-5 HCA  
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5  
CMF C30 H24 N2

Relative stereochemistry.



RN 80218-52-6 HCA

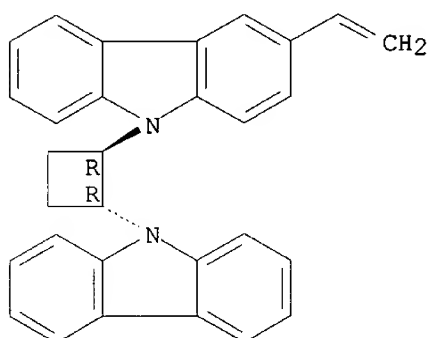
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-, polymer with 3-ethenyl-9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

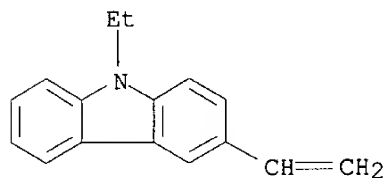
Relative stereochemistry.



CM 2

CRN 1486-07-3

CMF C16 H15 N



CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 76

IT 25569-45-3 77110-01-1 80218-51-5 80218-52-6

RL: USES (Uses)

(photocond. of unsensitized, for electrophotog.)

L55 ANSWER 8 OF 34 HCA COPYRIGHT 2003 ACS

99:140748 Design, synthesis, and excited state interactions of photoresponsive polymers. Tazuke, Shigeo; Inoue, Takashi (Res. Lab. Resour. Util., Tokyo Inst. Technol., Yokohama, Japan). Proc. IUPAC, I. U. P. A. C., Macromol. Symp., 28th, 234. Int. Union Pure Appl. Chem.: Oxford, UK. (English) 1982. CODEN: 50DXAF.

AB Polymers prep'd. from trans-1,2-dicarbazolylcyclobutane (I) had photocond. better than or comparable to poly(9-vinylcarbazole). I groups in the polymers maintained the sufficient interchromophore interactions for energy migration, but not for excimer formation. A high initial surface charge, slow dark decay, and short decay half time for I polymers were det'd. from xerog. discharge patterns.

IT 87318-35-2P 87318-37-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and photocond. of)

RN 87318-35-2 HCA

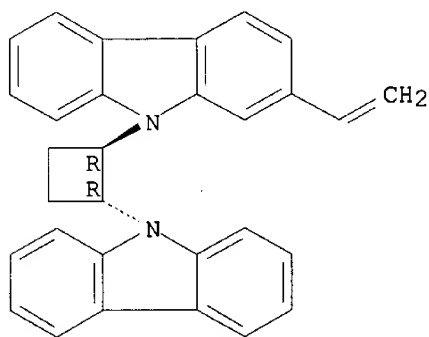
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-2-ethenyl-, trans-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 87318-34-1

CMF C30 H24 N2

Relative stereochemistry.



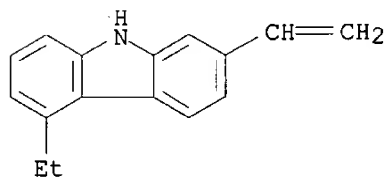
RN 87318-37-4 HCA

CN 9H-Carbazole, 2-ethenyl-5-ethyl-, polymer with trans-9-[2-(9H-carbazol-9-yl)cyclobutyl]-2-ethenyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 87318-36-3

CMF C16 H15 N

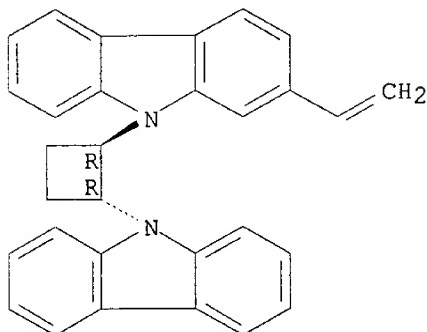


CM 2

CRN 87318-34-1

CMF C30 H24 N2

Relative stereochemistry.



CC 36-5 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 35, 74

IT 87318-31-8P 87318-33-0P **87318-35-2P 87318-37-4P**

87322-64-3P 87322-65-4P 87323-44-2P 87323-45-3P

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. and photocond. of)

L55 ANSWER 9 OF 34 HCA COPYRIGHT 2003 ACS

99:6224 Poly(arylenevinylenes). (Asahi Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 57207619 A2 19821220 Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1981-92154 19810617.

AB Elec. conductive poly(arylenevinylenes) are prepd. by polymg. arom. compds. having halogen and vinyl groups in the presence of catalysts. Thus, a mixt. of 4-bromostyrene 1.83, Bu<sub>3</sub>N [102-82-9] 1.95, Pd(OAc)<sub>2</sub> [3375-31-3] 0.022, tri-2-tolylphosphine [6163-58-2] 0.122, and PhCl 4.4 parts was heated 20 h at 100-120.degree. to give 1.06 parts yellow polymer [24936-50-3].

IT **79591-10-9P**

RL: PREP (Preparation)

(prepn. of, catalysts for)

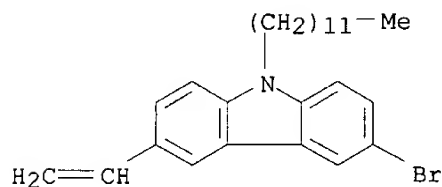
RN 79591-10-9 HCA

CN 9H-Carbazole, 3-bromo-9-dodecyl-6-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79591-09-6

CMF C26 H34 Br N

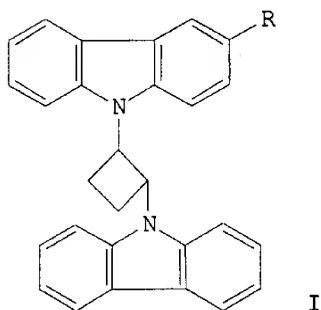




IC C08G061-02; C08G061-12  
CC 35-5 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 76  
IT **79591-10-9P** 86068-35-1P 86068-36-2P 86068-37-3P  
RL: PREP (Preparation)  
(prepn. of, catalysts for)

L55 ANSWER 10 OF 34 HCA COPYRIGHT 2003 ACS  
98:143977 trans-1-(3-Vinyl-9-carbazolyl)-2-(9-carbazolyl)-cyclobutane and its  
photoconductive polymers. (Tafu, Shigeo, Japan; Permachem Asia, Ltd.).  
Jpn. Kokai Tokkyo Koho JP 57179159 A2 19821104 Showa, 5 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1981-62536 19810427.

GI



AB The reaction of trans-I (R = CHO) (II) [77101-72-5] with Ph<sub>3</sub>P:CH<sub>2</sub> [3487-44-3] gave trans-I (R = CH:CH<sub>2</sub>) (III) [80217-96-5], which was polymd. alone or with 9-ethyl-3-vinylcarbazole to form photoconductive polymers. Thus, adding 33.22 g Ph<sub>3</sub>PMe<sup>+</sup> Br<sup>-</sup> to 5.54 g NaH in DMSO, adding 35 g II, and keeping the mixt. 1.5 h at room temp. gave 63% III.

IT **80218-51-5P 80218-52-6P**  
RL: PREP (Preparation)  
(photoconductive, manuf. of)

RN 80218-51-5 HCA

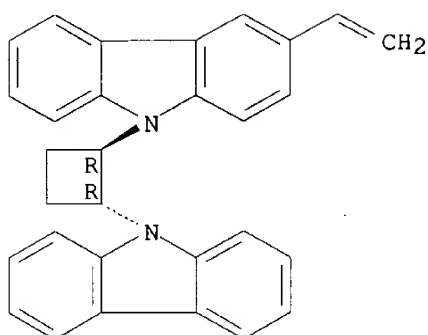
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-,  
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

Relative stereochemistry.



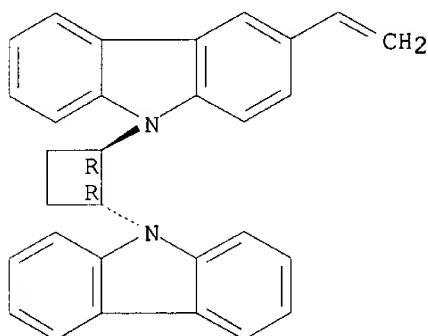
RN 80218-52-6 HCA  
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-,  
polymer with 3-ethenyl-9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

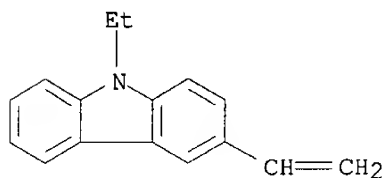
Relative stereochemistry.



CM 2

CRN 1486-07-3

CMF C16 H15 N



IC C07D209-86; C08F026-12  
ICA C07D209-88; C09K003-00; G03G005-07  
CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 27, 74  
IT 80218-51-5P 80218-52-6P

RL: PREP (Preparation)  
(photoconductive, manuf. of)

L55 ANSWER 11 OF 34 HCA COPYRIGHT 2003 ACS

98:98801 Xerographic plate. Massiani, Andre; De Michelis-Quiriconi, Raymond (Fr.). Fr. Demande FR 2503406 A1 19821008, 18 pp. (French). CODEN: FRXXBL. APPLICATION: FR 1981-6591 19810331.

AB A xerog. image-forming process which has low charge degrdn. but high spectral response consists of a conductive support coated with a photogeneration layer and then a photoreceptor layer. The former comprises essentially Te and Se at 5-25 and 75-90% by wt., resp., at a crit. layer thickness of between 0.05 and 0.5 .mu.. The photoreceptor layer contains an active org. material which is typically a polymer contg. repeating polynuclear arom. hydrocarbons, such as poly(N-vinylcarbazole) or a copolymer of, for example, N-vinylcarbazole and Me acrylate or a nonpolymer such as benzothiophene.

IT **55447-28-4 55447-32-0**

RL: USES (Uses)

(electrophotog. plate with selenium-tellurium layer and layer contg.)

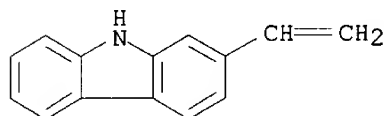
RN 55447-28-4 HCA

CN 9H-Carbazole, 2-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 40911-19-1

CMF C14 H11 N



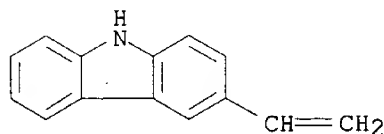
RN 55447-32-0 HCA

CN 9H-Carbazole, 3-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 55447-31-9

CMF C14 H11 N



IC G03G005-00

CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 50-32-8, uses and miscellaneous 53-70-3 56-55-3 84-65-1 85-01-8,  
uses and miscellaneous 86-28-2 86-73-7 86-74-8 91-20-3, uses and  
miscellaneous 92-24-0 129-00-0, uses and miscellaneous 132-65-0  
198-55-0 213-46-7 214-17-5 215-58-7 217-59-4 218-01-9 486-25-9  
605-02-7 948-65-2 1150-62-5 1484-09-9 1714-29-0 2381-21-7  
3264-21-9 13638-82-9 17088-22-1 25036-01-5 25067-59-8 25120-43-8  
26589-93-5 27599-53-7 27967-80-2 29659-51-6 30373-59-2  
36730-05-9 **55447-28-4 55447-32-0** 75779-45-2

79570-64-2 79570-66-4 84826-21-1

RL: USES (Uses)

(electrophotog. plate with selenium-tellurium layer and layer contg.)

L55 ANSWER 12 OF 34 HCA COPYRIGHT 2003 ACS

96:35806 Poly[trans-1-(3-vinyl-9-carbazolyl)-2-(9-carbazolyl)cyclobutane]. Synthesis and comparison with poly(9-ethyl-3-vinylcarbazole). Inoue, Takashi; Tazuke, Shigeo (Res. Lab. Resour. Util., Tokyo Inst. Technol., Yokohama, 227, Japan). Journal of Polymer Science, Polymer Chemistry Edition, 19(11), 2861-8 (English) 1981. CODEN: JPLCAT. ISSN: 0449-296X.

AB trans-1-(3-Vinyl-9-carbazolyl)-2-(9-carbazolyl)cyclobutane (I) [80217-96-5] was prepd. and cationically homo- or copolymd. with 9-ethyl-3-vinylcarbazole (II). I polymd. to high-mol.-wt. (>105) polymer [80218-51-5] with good yields, although its polymerizability was lower than that of II. The compn. of I-II copolymer [80218-52-6] was detd. by gel permeation chromatog. anal., based on the remaining monomer ratio. Fluorescence spectroscopy indicated that I polymer did not form excimers. Excimer emission gradually appeared with increasing II content in the copolymer. The lack of excimer emission in I homopolymers was attributed to crowded and sterically distorted chromophore assemblies. <sup>1</sup>H- and <sup>13</sup>C-NMR spectroscopy of cyclobutane groups in the I polymer compared with that in trans-1,2-bis(9-carbazolyl)cyclobutane) model compd. supported the conclusion derived from fluorescence.

IT 80218-52-6

RL: PRP (Properties)

(excimer fluorescence of)

RN 80218-52-6 HCA

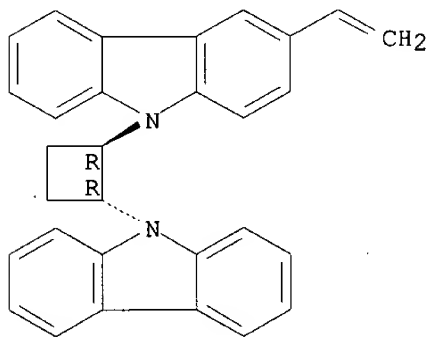
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-, polymer with 3-ethenyl-9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

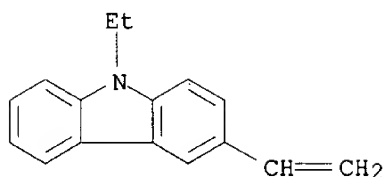
Relative stereochemistry.



CM 2

CRN 1486-07-3

CMF C16 H15 N



IT **80218-51-5P**

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

RN 80218-51-5 HCA

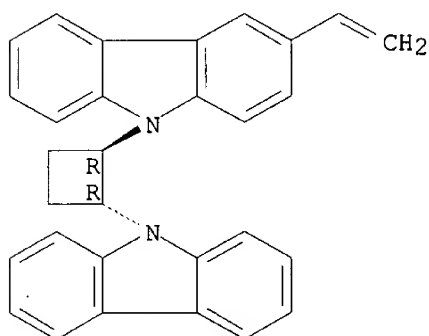
CN 9H-Carbazole, 9-[2-(9H-carbazol-9-yl)cyclobutyl]-3-ethenyl-, trans-,  
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 80217-96-5

CMF C30 H24 N2

Relative stereochemistry.



CC 35-4 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 27

IT 25569-45-3 **80218-52-6**

RL: PRP (Properties)

(excimer fluorescence of)

IT **80218-51-5P**

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

L55 ANSWER 13 OF 34 HCA COPYRIGHT 2003 ACS

95:204697 Poly(3,6-carbazolediylvinylene) derivatives. (Asahi Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 56086160 19810713 Showa, 7 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1979-163569 19791218.

AB Carbazole derivs. having halogen, Cl-16 alkyl, and vinyl substituents on 3, 9, and 6-positions, resp., are polymd. in the presence of Pd(OAc)<sub>2</sub> [3375-31-3], triarylphosphine, and tertiary amines to give photoconductive polymers. Thus, 3-bromo-9-dodecyl-6-vinyl-9H-carbazole 1.78, Bu<sub>3</sub>N [102-82-9] 1.17, Pd(OAc)<sub>2</sub> 0.012, (o-MeC<sub>6</sub>H<sub>4</sub>)<sub>3</sub>P [6163-58-2] 0.060, and xylene 2.0 parts was stirred 20 h at 120.degree. to give 1.38 parts polymer [79591-10-9] having no.-av. mol. wt. 3900 and polydispersity 2.6.

IT **79591-10-9P**

RL: IMF (Industrial manufacture); PREP (Preparation)  
(manuf. of, catalysts for)

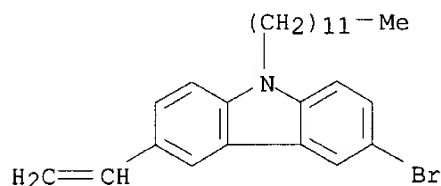
RN 79591-10-9 HCA

CN 9H-Carbazole, 3-bromo-9-dodecyl-6-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79591-09-6

CMF C26 H34 Br N



IC C07D209-86; C08G061-12; G03G005-07; H01L031-00

CC 35-4 (Synthetic High Polymers)

IT 79591-03-0P **79591-10-9P**

RL: IMF (Industrial manufacture); PREP (Preparation)  
(manuf. of, catalysts for)

L55 ANSWER 14 OF 34 HCA COPYRIGHT 2003 ACS

92:198888 The synthesis and emission properties of poly(N-ethyl-4-vinylcarbazole). Keyanpour-Rad, M.; Ledwith, A.; Johnson, G. E. (Donnan Lab., Univ. Liverpool, Liverpool, L69 3BX, UK). Macromolecules, 13(2), 222-9 (English) 1980. CODEN: MAMOBX. ISSN: 0024-9297.

AB The NMR of poly(9-ethyl-4-vinylcarbazole) (I) [**72863-16-2**], prepd. by radical, anionic, or cationic polymn., showed greater steric interference between neighboring chromophores than in poly(9-ethyl-2-vinylcarbazole) (II) [**41008-78-0**], poly(9-ethyl-3-vinylcarbazole) (III) [25569-45-3], or poly(9-vinylcarbazole) (IV) [25067-59-8]. I, II, and III show carbazole monomer-like and interchain excimer fluorescence, while IV shows only excimer fluorescence from 2 distinct intrachain excimer states. The emission spectra of II and I are nearly indistinguishable, but fluorescence decay shows significant differences in the kinetics of intrachain excimer formation and dissocn. The high excimer-monomerlike fluorescence ratio of III, relative to I and II, is attributed to a higher isotactic content as a result of cationic polymn.

IT **41008-78-0**

RL: PRP (Properties)  
(excimer fluorescence of)

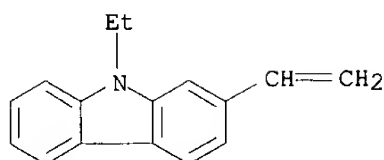
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N

IT **72863-16-2**

RL: PRP (Properties)

(excimer fluorescence of, steric hindrance effect on)

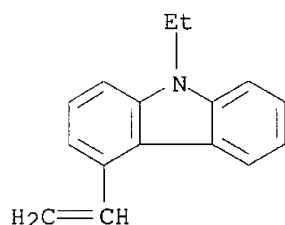
RN 72863-16-2 HCA

CN 9H-Carbazole, 4-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1 .

CRN 72860-86-7

CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)

Section cross-reference(s): 73

IT 25067-59-8 **41008-78-0**

RL: PRP (Properties)

(excimer fluorescence of)

IT **72863-16-2**

RL: PRP (Properties)

(excimer fluorescence of, steric hindrance effect on)

L55 ANSWER 15 OF 34 HCA COPYRIGHT 2003 ACS

92:119626 Intramolecular energy transfer by singlet and triplet excitons in macromolecules. Faigysh, A. N.; Slobodyanik, V. V.; Yashchuk, V. N.

(Phys. Dep., Kiev Univ., Kiev, USSR). Journal of Luminescence, 21(1),

85-92 (English) 1979. CODEN: JLUMA8. ISSN: 0022-2313.

AB Absorption, luminescence, and photooxidn. of poly(vinylcarbazole) (I) and poly(vinylbenzocarbazole) (II) in weak solns. were studied. The fluorescence and phosphorescence spectra, obsd. at 293, 77, and 4.2 K, depend on the mol. mass of the polymer and on the exptl. conditions. Because of efficient intramol. energy transfer the fluorescence spectrum includes the emission of excimers, emission of end groups, and that of internal structural defects of a macrochain. The relative role of each emission markedly depends upon the mol. mass. Phosphorescence is largely detd. by the annihilation effects between triplet excitations, these effects being pronounced in long macrochains. The data show the excitonic nature of the singlet and triplet excitation energy transfer in the polymers studied. The migration of 1-dimensional singlet and triplet excitons strongly influences the luminescent properties. of I and II macromols. as well as their photochem. reactions. The range of singlet excitons in I and II macromols. was detd. both at room temp. and low temps.

IT 55447-28-4

RL: USES (Uses)

(absorption, luminescence, and photooxidn. of, intramol. energy transfer in relation to)

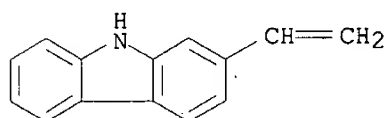
RN 55447-28-4 HCA

CN 9H-Carbazole, 2-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 40911-19-1

CMF C14 H11 N



CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic Processes)

Section cross-reference(s): 35

IT 28803-67-0 55447-28-4

RL: USES (Uses)

(absorption, luminescence, and photooxidn. of, intramol. energy transfer in relation to)

L55 ANSWER 16 OF 34 HCA COPYRIGHT 2003 ACS

92:42507 The origin of the optical anisotropy of solvent cast polymeric films. Prest, W. M., Jr.; Luca, D. J. (Webster Res. Cent., Xerox Corp., Webster, NY, 14580, USA). Journal of Applied Physics, 50(10), 6067-71 (English) 1979. CODEN: JAPIAU. ISSN: 0021-8979.

AB Solvent casting of polymer films [polystyrene [9003-53-6], bisphenol A polycarbonate [24936-68-3], poly(2,6-dimethyl-p-phenylene oxide) [24938-67-8], poly(N-vinylcarbazole) [25067-59-8] and derivs.] preferentially aligns their chains in the plane of the film, and this biaxial orientation may form birefringent films in optically anisotropic polymers. The sign of this birefringence depends on the orientation of the dominating polarizable group relative to the chain backbone in the plasticized melt. The magnitude of this effect reflects both the optical anisotropy of the group and the steric constraints on its rotation.

IT 41008-78-0

RL: USES (Uses)

(optical anisotropy of films of, solvent casting effect on)

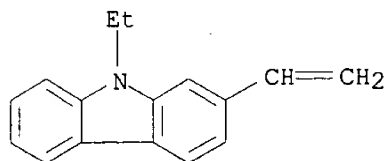
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)



Section cross-reference(s): 73

IT 9003-53-6 24936-68-3, uses and miscellaneous 24938-67-8 25037-45-0  
25067-59-8 25134-01-4 25569-45-3 **41008-78-0** 55774-96-4  
RL: USES (Uses)  
(optical anisotropy of films of, solvent casting effect on)

L55 ANSWER 17 OF 34 HCA COPYRIGHT 2003 ACS

89:215895 Optically active vinyl polymers containing fluorescent groups. 5.  
Fluorescence properties of poly(9-vinylcarbazole) and optically active  
polymers containing carbazole units. Houben, Julien L.; Natucci, Barbara;  
Solaro, Roberto; Colella, Orlando; Chiellini, Emo; Ledwith, Anthony (Lab.  
Stud. Prop. Fis. Biomol. Cell., Pisa, Italy). Polymer, 19(7), 811-18  
(English) 1978. CODEN: POLMAG. ISSN: 0032-3861.

AB Three optically active poly(vinylcarbazoles), e.g. poly[(S)-3-sec-butyl-9-  
vinylcarbazole] [68379-57-7], and one copolymer, (-)menthyl vinyl  
ether-9-vinylcarbazole copolymer [68421-56-7] contg. 0.1-93.8% carbazole  
units, exhibited fluorescence related to that of cationically and free  
radically prepd. poly(9-vinylcarbazole) [25067-59-8]. The fluorescence  
arises from monomeric carbazole emission, high energy excimer emission,  
and a more usual excimer emission from conformationally eclipsed carbazole  
units. Correlations of fluorescence and fluorescence quenching by maleic  
anhydride [108-31-6] with chiroptical properties and copolymer compn.  
suggest that excimer formation is due to rotational freedom within or  
between isotactic carbazole sequences in the polymer backbones. The  
isotactic copolymers exhibit strong excimer fluorescence even though mean  
sequence lengths of carbazole units are short.

IT **68379-58-8 68379-59-9**

RL: PRP (Properties)  
(fluorescence of)

RN 68379-58-8 HCA

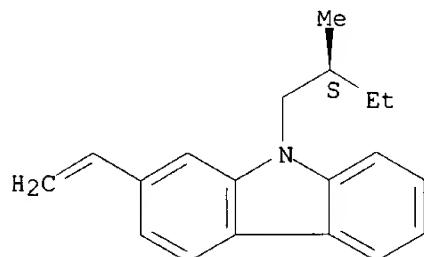
CN 9H-Carbazole, 2-ethenyl-9-(2-methylbutyl)-, (S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 60206-34-0

CMF C19 H21 N

Absolute stereochemistry.



RN 68379-59-9 HCA

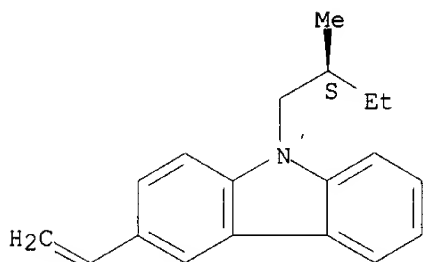
CN 9H-Carbazole, 3-ethenyl-9-(2-methylbutyl)-, (S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 60206-35-1

CMF C19 H21 N

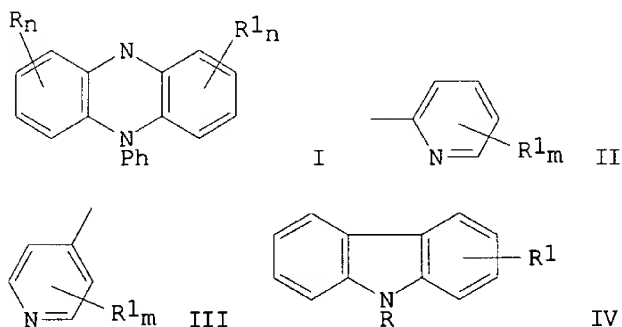
Absolute stereochemistry.



CC 35-5 (Synthetic High Polymers)  
 IT 67699-51-8 67699-52-9 67699-53-0 68379-57-7 **68379-58-8**  
**68379-59-9**  
 RL: PRP (Properties)  
 (fluorescence of)

L55 ANSWER 18 OF 34 HCA COPYRIGHT 2003 ACS  
 89:14821 Photosensitive composition useful in photoelectrophoretic imaging.  
 Nealy, Richard H. (Xerox Corp., USA). U.S. US 4076527 19780228, 10 pp.  
 (English). CODEN: USXXAM. APPLICATION: US 1976-735355 19761026.

GI



AB Photosensitive compns. for photoelectrophoretic imaging systems are comprised of a vanadyl phthalocyanine pigment, a desensitizing phenazine dye I [R, R1 = NH2, NHR2 where R2 = Ph, phenylsulfonate; m, n = 0, 1, 2] 0.01-10 and a mixt. of .gtoreq.1 polymer (20-80 wt. %) of the formula [CH2CHR]n [R = II, III where R1 = a substituent substantially incapable of withdrawing electrons from the electron rich pyridinyl moiety and m = 0-3; n .gtoreq. 25] and .ltoreq.1 polymer (80-20 wt. %) prepd. from the monomer IV (R, R1 = vinyl, .alpha.-alkylvinyl, C 1-4 alkyl with only 1 of R, R1 being vinyl or .alpha.-alkylvinyl] 1-5 wt. % (based on the pigment content). With the presence of the phenazine dye and the polymer mixt., the photoresponse of the vanadyl phthalocyanine pigment is modified and the injection of charge into the pigment is inhibited. Thus, vanadyl phthalocyanine treated with Indulin 6 B tetrasulfonate 1 g was dispersed in a C6H6 soln. contg. 10 wt. % of a polymer mixt. (based on the pigment content) contg. equal parts of poly(2-vinylpyridine) and poly(N-ethyl-3-vinylcarbazole), ball-milled, transferred to a flask contg. mineral oil 30 mL, and heated on a H2O bath at reduced pressure to evap.

C6H6 to give a photosensitive pigment compn.

IT 41008-78-0P 55447-28-4P 55447-30-8P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

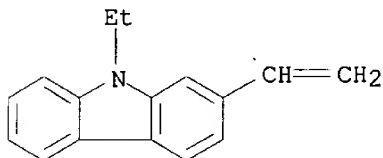
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



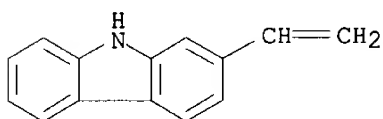
RN 55447-28-4 HCA

CN 9H-Carbazole, 2-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 40911-19-1

CMF C14 H11 N



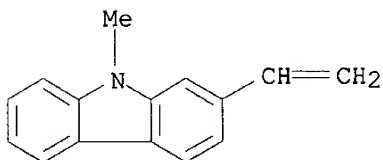
RN 55447-30-8 HCA

CN 9H-Carbazole, 2-ethenyl-9-methyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 55447-29-5

CMF C15 H13 N



IC G03G005-04

NCL 096001000PE

CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic Processes)

IT 41008-78-0P 55447-28-4P 55447-30-8P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

L55 ANSWER 19 OF 34 HCA COPYRIGHT 2003 ACS

86:190565 Anomalous relaxations in carbazole polymers. Froix, M. F.;

Williams, D. J.; Pochan, J. M.; Goedde, A. O. (Xerox Corp., Webster, NY, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 16(2), 576-82 (English) 1975. CODEN: ACPPAY. ISSN: 0032-3934.

AB The nature and degree of local ordering in poly(N-vinylcarbazole) (I) [25067-59-8], poly(N-ethyl-2-vinylcarbazole) (II) [41008-78-0], and poly(N-ethyl-3-vinylcarbazole) (III) [25569-45-3] is inferred from measurements of the NMR proton spin-spin (T2) and spin-lattice (T1) relaxation times in the interval between the liq. N and glass transition temps. in vacuo and in the presence of O or air. The T1 data for all 3 degassed polymers showed 3 relaxation regions: a high-temp .alpha. relaxation (assocd. with glass transition), a .gamma. relaxation (280-440K, ascribed to oscillation of the pendant carbazole ring system), and a low-temp. min. (attributed to reorientation of Et groups in II and III and to the motion of end groups or low-mol.-wt. fractions in I). In air or O, a T1 min. appeared for I samples at 210K where none existed for the degassed sample and the T1 min. for II and III were vastly reduced and shifted by .apprx.30K to lower temps. The anomalous min. for I was attributed to O interaction with the carbazole ring. A T2 transition is also obsd. at 210K for I in O. This transition, similarly to the T1 .gamma. relaxation, is assigned to torsional oscillation of the carbazole ring. The T2 behavior for degassed II and III is similar to that for I.

IT 41008-78-0

RL: PRP (Properties)

(local ordering in, NMR spin-spin and spin-lattice relaxations in relation to)

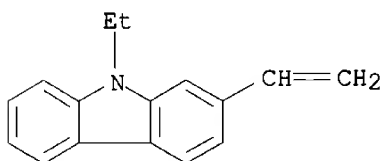
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)

Section cross-reference(s): 73

IT 25067-59-8 25569-45-3 41008-78-0

RL: PRP (Properties)

(local ordering in, NMR spin-spin and spin-lattice relaxations in relation to)

L55 ANSWER 20 OF 34 HCA COPYRIGHT 2003 ACS

86:90704 Dielectric relaxations in a series of vinyl aromatic polymers: poly(2-vinyl-N-ethylcarbazole), poly(3-vinyl-N-ethylcarbazole), poly(2-vinylanthracene), and poly(.alpha.-methyl-2-vinylanthracene). Pochan, J. M.; Hinman, D. F. (Xerox Corp., Webster, NY, USA). Journal of Polymer Science, Polymer Physics Edition, 14(12), 2285-90 (English) 1976. CODEN: JPLPAY. ISSN: 0098-1273.

AB Two dielec. relaxations in poly(2-vinyl-N-ethylcarbazole) [41008-78-0] and poly(3-vinyl-N-ethylcarbazole) [25569-45-3] occurred in the temp. regions +220.degree. and -150.degree. and evidence for a third relaxation in both polymers at about +120.degree. was found.

The relaxations studied at 200.degree. and -150.degree. were labeled .alpha. and .gamma., resp., and were assigned as Tg and carbazole rotational vibration about the bond connecting the carbazole moiety to polymer backbone. Addnl., .beta. and .gamma. relaxations were obsd. in poly(2-vinylanthracene) [57292-04-3] at +20.degree. and in poly(.alpha.-methyl-2-vinylanthracene) [57292-03-2] at -150.degree. and were assocd. with wagging motions in the pendent polymer moiety and to rotational libration of the moiety about the bond connecting it to the polymer backbone, resp.

IT **41008-78-0**

RL: USES (Uses)

(dielec. relaxation in)

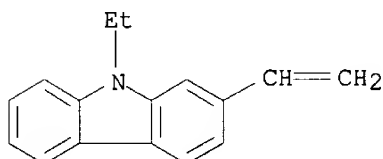
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



CC 36-5 (Plastics Manufacture and Processing)

IT 25569-45-3 **41008-78-0** 57292-03-2 57292-04-3

RL: USES (Uses)

(dielec. relaxation in)

L55 ANSWER 21 OF 34 HCA COPYRIGHT 2003 ACS

86:55770 Structural variations and multiple charge transfer transitions between chloranil and carbazole derivatives. Landman, Uzi; Ledwith, A.; Marsh, D. G.; Williams, D. J. (Xerox Webster Res. Lab., Rochester, NY, USA). Macromolecules, 9(5), 833-9 (English) 1976. CODEN: MAMOBX. ISSN: 0024-9297.

AB Asym. charge transfer spectra from combinations of carbazole derivs. and chloranil consisted of two bands originating from the first and second highest occupied mol. orbitals of the carbazole. The most probable mol. organization for a carbazole-chloranil pair is coplanar but unsym. The charge transfer spectrum for the poly(N-vinylcarbazole)-chloranil complex [27516-26-3] was different from those of simple model complexes, such as the chloranil-N-ethylcarbazole complex, apparently because of steric hindrance. In contrast, polymers such as poly(N-ethyl-2-vinylcarbazole), which are based on unsym. donor components, gave, with chloranil, multiple charge transfer transitions essentially identical in relative intensities to those of the corresponding model compds.

IT **60877-16-9 60877-17-0**

RL: PRP (Properties)

(charge transfer spectra of)

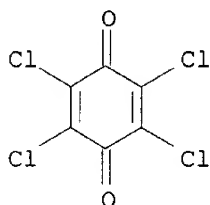
RN 60877-16-9 HCA

CN 2,5-Cyclohexadiene-1,4-dione, 2,3,5,6-tetrachloro-, compd. with 2-ethenyl-9-ethyl-9H-carbazole homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 118-75-2

CMF C6 Cl4 O2



CM 2

CRN 41008-78-0

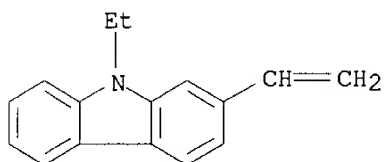
CMF (Cl6 H15 N)x

CCI PMS

CM 3

CRN 38627-52-0

CMF Cl6 H15 N



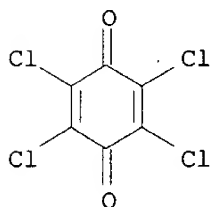
RN 60877-17-0 HCA

CN 2,5-Cyclohexadiene-1,4-dione, 2,3,5,6-tetrachloro-, compd. with  
3-ethenyl-9-ethyl-9H-carbazole homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 118-75-2

CMF C6 Cl4 O2



CM 2

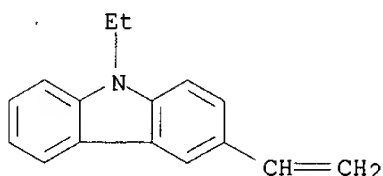
CRN 25569-45-3

CMF (Cl6 H15 N)x

CCI PMS

CM 3

CRN 1486-07-3  
CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)

Section cross-reference(s): 22

IT 25067-59-8D, chlorinated, complex with chloranil 27516-26-3 30605-95-9  
41138-29-8 54175-76-7 56384-87-3 56384-88-4 60834-31-3  
60834-32-4 60834-33-5 60834-34-6 60834-35-7 60834-37-9  
60834-38-0 60834-39-1 60834-41-5 60834-43-7 60871-65-0  
**60877-16-9 60877-17-0**

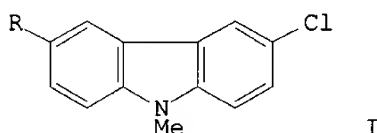
RL: PRP (Properties)

(charge transfer spectra of)

L55 ANSWER 22 OF 34 HCA COPYRIGHT 2003 ACS

85:177186 Behavior of 3-chloro-9-methylcarbazole in reactions with the carbonium-oxonium intermediate  $\text{CH}_3\text{-CH}(+)\text{-O-C}_2\text{H}_5$ . Sizova, L. S.; Sirothkina, E. E.; Filimonov, V. D. (USSR). Tezisy Dokl. - Simp. Khim. Tekhnol. Geterotsikl. Soedin. Goryuch. Iskop., 2nd, 75-6. Donetsk. Gos. Univ.: Donetsk, USSR. (Russian) 1973. CODEN: 33XLA8.

GI



AB 3-Chloro-9-methylcarbazole (I, R = H) treated with  $\text{MeC+HOEt}$ , generated from  $\text{MeCH(OEt)}_2$ ,  $\text{EtOCH:CH}_2$  or  $\text{MeCHClOEt}$ , in  $\text{C}_6\text{H}_6$ ,  $\text{Me}_2\text{CO}$ , or  $\text{MeCOEt}$  contg. strong acids gave polymeric I (R =  $\text{CH:CH}_2$ ) formed from intermediate I (R =  $\text{MeCHOEt}$ ).

IT **60806-34-0P**

RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, in reaction of chloromethylcarbazole with acetals)

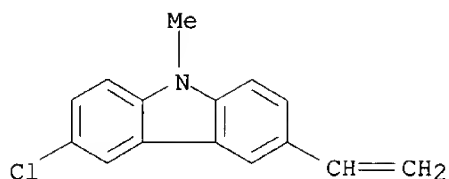
RN 60806-34-0 HCA

CN 9H-Carbazole, 3-chloro-6-ethenyl-9-methyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 60806-33-9

CMF C15 H12 Cl N



CC 27-11 (Heterocyclic Compounds (One Hetero Atom))  
IT **60806-34-0P** 61059-72-1P  
RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, in reaction of chloromethylcarbazole with acetals)

L55 ANSWER 23 OF 34 HCA COPYRIGHT 2003 ACS  
84:122464 Nuclear magnetic resonance relaxation time studies of photoconductive polymers. Poly(N-ethyl-2-vinylcarbazole) and poly(N-ethyl-3-vinylcarbazole). Froix, M. F.; Williams, D. J.; Goedde, A. O. (Webster Res. Cent., Xerox Corp., Webster, NY, USA). Macromolecules, 9(1), 81-4 (English) 1976. CODEN: MAMOBX. ISSN: 0024-9297.

AB Proton nuclear spin-lattice (T1) and spin-spin (T2) relaxation times measured for poly(N-vinylcarbazole) (I) [25067-59-8], poly(N-ethyl-2-vinylcarbazole) (II) [**41008-78-0**], and poly(N-ethyl-3-vinylcarbazole) (III) [25569-45-3] were used to calc. correlation frequencies which, together with dielec. data reported by J.M. Pochan and D. D. Hinman (1975), were used to construct transition maps which showed details of the mol. dynamics of these polymers. The measurements revealed an addnl., extremely efficient, .delta.-relaxation in II and III due to ethyl group rotation. This relaxation resulted in a lowering of T1 values via spin diffusion over those obtained for degased I. The .gamma.-relaxation corresponding to torsional oscillation of the pendant group had a lower activation energy in II and III than in I at 4.2, 5.2, and 7.8 kcal/mole, resp. The T1 minimums corresponding to this relaxation were more intense and occurred at lower temps. than in I indicating a narrower distribution of correlation frequencies. The gradual increase in T2 below the glass transition temp. in conjunction with the well defined Ti minimums indicated a gradual increase in amplitude for the .gamma.-process. These observations, examn. mol. models, and the lower activation energies for the .alpha.-relaxation were consistent with a lower degree of steric hindrance in II and III than in I. The implications of the nature, frequency, and amplitude of the various motions for charge transport were discussed.

IT **41008-78-0**  
RL: USES (Uses)  
(chain relaxation in, NMR relaxation times in relation to)

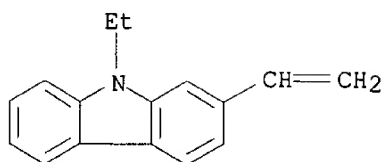
RN 41008-78-0 HCA  
CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0  
CMF C16 H15 N

*2. amuse*





CC 35-5 (Synthetic High Polymers)  
IT 25067-59-8 25569-45-3 **41008-78-0**  
RL: USES (Uses)

(chain relaxation in, NMR relaxation times in relation to)

L55 ANSWER 24 OF 34 HCA COPYRIGHT 2003 ACS

83:98079 Emission properties of vinylcarbazole polymers. Johnson, G. E. (Webster Res. Cent., Xerox Corp., Webster, NY, USA). Journal of Chemical Physics, 62(12), 4697-709 (English) 1975. CODEN: JCPSA6. ISSN: 0021-9606.

AB The emission properties of poly(N-vinylcarbazole) (I) [25067-59-8], poly(N-ethyl-2-vinylcarbazole) (II) [**41008-78-0**], and poly(N-ethyl-3-vinylcarbazole) (III) [25569-45-3] were investigated. Dilute fluid solns. of I-III exhibited structureless emission bands at energies approx. 5400 cm<sup>-1</sup> to the red of the (0,0) band of the normal mol. fluorescence of isolated monomer compds. On the basis of earlier work with appropriate model compds., this emission was assigned to that from an intrachain excimer state in which 2 interacting pendant groups, one of which was electronically excited, obtained an overlapping, eclipsed, sandwichlike configuration. The emission spectrum of I was characterized by the appearance of a second structureless emission band which appeared at higher energy than the intrachain excimer fluorescence common to I, II, and III. This emission band was unique to I and under certain conditions to its model compd., 1,3-bis(N-carbazolyl)propane. This emission was assigned to that from a second intrachain excimer. Contrary to the lower energy intrachain excimer, the polymer conformation appropriate for formation of this state exist prior to the initial excitation step.

IT **41008-78-0**

RL: USES (Uses)  
(excimer, emission spectra of)

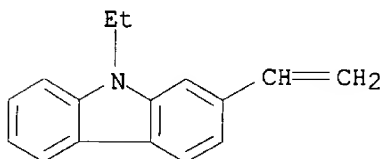
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)  
Section cross-reference(s): 73  
IT 25067-59-8 25569-45-3 **41008-78-0**  
RL: USES (Uses)  
(excimer, emission spectra of)

L55 ANSWER 25 OF 34 HCA COPYRIGHT 2003 ACS

82:156870 Electrical properties of a series of carbazole polymers. Williams, D. J.; Limburg, W. W.; Pearson, J. M.; Goedde, A. O.; Yanus, J. F. (Webster Res. Cent., Xerox Corp., Webster, NY, USA). Journal of Chemical Physics, 62(4), 1501-6 (English) 1975. CODEN: JCPSA6. ISSN: 0021-9606.

AB The three polymers poly(N-vinylcarbazole) (I) [25067-59-8], poly(N-ethyl-2-vinylcarbazole) (II) [41008-78-0] and poly(N-ethyl-3-vinylcarbazole) (III) [25569-45-3] exhibited electrical carrier mobility which varied as the square root of the elec. field over the range of fields examd. and was not directly related to obsd. variations in NMR chem. shifts resulting from inter-ring shielding effects. II, which showed the overall largest upfield shift of the arom. protons, exhibited a mobility of  $1.4 \times 10^{-6}$  cm<sup>2</sup>/V sec at a field of  $4 \times 10^5$  V/cm. I, which exhibited an intermediate degree of shielding, had a mobility of  $1.4 \times 10^{-7}$  cm<sup>2</sup>/V sec and III, which exhibited the smallest shielding effect had a mobility of  $2.4 \times 10^{-8}$  cm<sup>2</sup>/V sec both at equiv. fields. Grouped mobilities were measured in films of polymers overcoated with thin layers of amorphous Fe using a xerog. discharge technique. Under the conditions for observing trap free charge limited currents the hole mobilities were calcd. from Child's law. Although II showed the highest mobility it also accumulated the largest amt. of trapped charge.

IT 41008-78-0

RL: PRP (Properties)

(electrical transport property of, structure effect on)

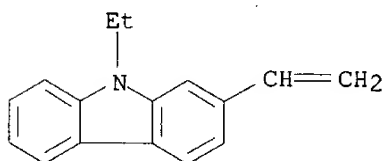
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)

IT 25067-59-8 25569-45-3 41008-78-0

RL: PRP (Properties)

(electrical transport property of, structure effect on)

L55 ANSWER 26 OF 34 HCA COPYRIGHT 2003 ACS

80:146624 Vinylcarbazole polymer. Sumitomo, Yoshiharu; Inoue, Sajiro (Kohjin Co., Ltd.). Jpn. Tokkyo Koho JP 48011230 B4 19730411 Showa, 4 pp. (Japanese). CODEN: JAXXAD. APPLICATION: JP 1970-77528 19700905.

AB Poly(1-vinylcarbazole) [25067-59-8] and its halogenated derivs., e.g. poly(1-vinyl-3-chlorocarbazole) [51365-56-1], poly(1-vinyl-3-bromocarbazole) [51553-88-9] used as photosensitive or dielec. materials were prep'd. by mixing the carbazole monomer and vinyl acetate [108-05-4] with an anion exchanger and a mercury salt, e.g. mercury sulfate [13766-44-4] or mercury acetate [592-63-2].

IC C08F; B01J

CC 35-4 (Synthetic High Polymers)

L55 ANSWER 27 OF 34 HCA COPYRIGHT 2003 ACS

80:15343 Variation in interrering interactions in a series of carbazyl group containing polymers. Limburg, W. W.; Williams, D. J. (Rochester Res. Cent., Xerox Corp., Webster, NY, USA). *Macromolecules*, 6(5), 787-8 (English) 1973. CODEN: MAMOBX. ISSN: 0024-9297.

AB Poly(N-ethyl-3-vinylcarbazole) [25569-45-3] and poly(N-ethyl-2-vinylcarbazole) [41008-78-0] were prepd. by free radical polymn. of the corresponding monomers, and were shown by NMR to have less tightly packed carbazole rings than the unsubstituted polymer, esp. in the case of the 3-ethyl deriv.

IT 41008-78-0

RL: PRP (Properties)  
(conformation of, NMR detn. of)

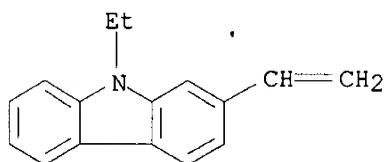
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N



CC 35-5 (Synthetic High Polymers)

IT 25569-45-3 41008-78-0

RL: PRP (Properties)  
(conformation of, NMR detn. of)

L55 ANSWER 28 OF 34 HCA COPYRIGHT 2003 ACS

78:124954 Synthesis and polymerizability of N-ethyl-2-vinylcarbazole. Hyde, P.; Kricka, L. J.; Ledwith, A. (Dep. Inorg. Phys. Ind. Chem., Univ. Liverpool, Liverpool, UK). *Polymer*, 14(3), 124-5 (English) 1973. CODEN: POLMAG. ISSN: 0032-3861.

AB N-ethyl-2-vinylcarbazole (I) [38627-52-0] was prepd. and showed only slight reactivity in free radical homopolymn., whereas copolymn. with maleic anhydride under similar conditions (azobisisobutyronitrile initiation in THF at 50.deg.) gave almost quant. yields of 1:1 alternating copolymer. I was prepd. by ethylation of 2-vinylcarbazole (II) using  $\text{TiOEt} \cdot \text{EtI}$ ; II was prepd. by refluxing 2-acetylcarbazole (III) with Al isopropoxide in xylene. Friedel-Crafts acylation of 9-acetylcarbazole followed by hydrolysis of the intermediate product gave III.

IT 41077-32-1P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(alternating, prepn. of)

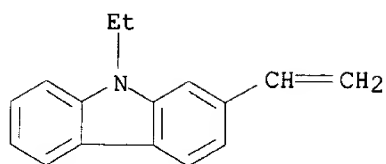
RN 41077-32-1 HCA

CN 2,5-Furandione, polymer with 2-ethenyl-9-ethyl-9H-carbazole (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

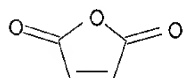
CMF C16 H15 N



CM 2

CRN 108-31-6

CMF C4 H2 O3



IT 41008-78-0P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, catalysts for)

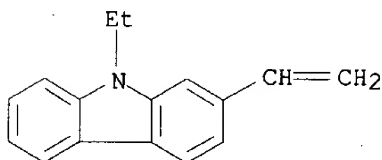
RN 41008-78-0 HCA

CN 9H-Carbazole, 2-ethenyl-9-ethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 38627-52-0

CMF C16 H15 N

CC 35-3 (Synthetic High Polymers)  
Section cross-reference(s): 27

IT 41077-32-1P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(alternating, prepn. of)

IT 41008-78-0P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, catalysts for)

L55 ANSWER 29 OF 34 HCA COPYRIGHT 2003 ACS

77:35325 Chemistry of carbazole derivatives. 50. Effect of the purity of 3-vinyl-9-ethylcarbazole on its copolymerization with divinylbenzene. Lopatinskii, V. P.; Sirotkina, E. E.; Grosheva, M. P. (USSR). Izvestiya Tomskogo Politeknicheskogo Instituta, 175, 21-4 (Russian) 1971. CODEN: ITPKAM. ISSN: 0368-0487.

AB The vacuum distn. of tech. 3-vinyl-9-ethylcarbazole (I) [1486-07-3] in the presence of 0.01% basic lead acetate [15347-57-6] gave I in 95% yield. The purified I was suitable for copolymerization with divinylbenzene [1321-74-0]. The sulfonation of 3-vinyl-9-ethylcarbazole-divinylbenzene copolymer [9039-00-3] gave sulfonated cation exchange resins.

CC 36-3 (Plastics Manufacture and Processing)

L55 ANSWER 30 OF 34 HCA COPYRIGHT 2003 ACS

72:22024 Dielectric relaxation and energy of segmental motion in polymers. Kessenikh, R. M.; Petrov, A. V. (Tomsk. Politekh. Inst. im. Kirova, Tomsk, USSR). Izvestiya Vysshikh Uchebnykh Zavedenii, Fizika, 12(9), 7-13 (Russian) 1969. CODEN: IVUFAC. ISSN: 0021-3411.

AB The temp.-frequency dependence of the tan dielec. loss for atactic polystyrene, poly-(9-vinylcarbazole), poly(3-vinyl-9-methylcarbazole), and poly-(3-vinyl-9-ethylcarbazole) was analyzed math., and the activation energies were detd. at the transition temps. and 100.degree. higher. Activation energies are 15-25 kcal/mole at the transition temps. and decrease to 8-14 kcal/mole at 100.degree. above the transition temps.

IT 25569-44-2

RL: PRP (Properties)

(dielec. relaxation of, energy of segmental motion in relation to)

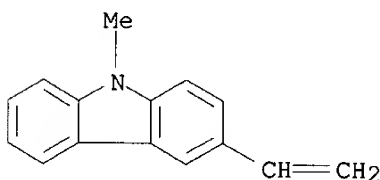
RN 25569-44-2 HCA

CN Carbazole, 9-methyl-3-vinyl-, polymers (8CI) (CA INDEX NAME)

CM 1

CRN 1486-08-4

CMF C15 H13 N



CC 35 (Synthetic High Polymers)

IT 9003-53-6, properties 25067-59-8 25569-44-2 25569-45-3

RL: PRP (Properties)

(dielec. relaxation of, energy of segmental motion in relation to)

L55 ANSWER 31 OF 34 HCA COPYRIGHT 2003 ACS

69:97212 Effect of monomer structure on the rate of initiation and the ratio of the propagation-rate constant to the square root of the termination rate constant in homopolymerization. Chernobai, A. V. (USSR). Vysokomolekulyarnye Soedineniya, Seriya A, 10(8), 1716-20 (Russian) 1968. CODEN: VYSAAF. ISSN: 0507-5475.

AB The title consts. were detd. and are tabulated for styrene (I), 4-vinyl-4'-methylbiphenyl (II), 4-vinyl-4'-methoxybiphenyl (III), 4-chlorostyrene (IV), 2,4,5-trimethylstyrene (V), 4-vinylpyridine (VI), acenaphthylene (VII), 3-vinyl-9-methylcarbazole (VIII), 1-vinyl-2-pyrrolidinone (IX), and 9-vinylcarbazole (X). Initiation and homopolymn. rates increased in the orders I < II < III, I < IV < V < VI, and IX < X. VIII had a higher homopolymn. rate than I. A lower homopolymn. rate and a higher initiation rate were shown by VII than by I. The title consts. were also detd. for p-RC6H4-CH:CH2, where R is OMe, Me, F, Cl, Br, and CN, resp. The factors detg. the kinetic parameters are the activities of the monomer mols. and not those of the polymer radicals.

IT 25569-44-2P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, rate consts. in)

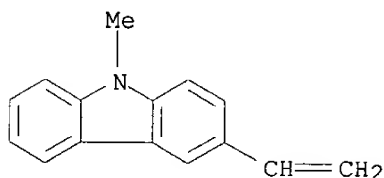
RN 25569-44-2 HCA

CN Carbazole, 9-methyl-3-vinyl-, polymers (8CI) (CA INDEX NAME)

CM 1

CRN 1486-08-4

CMF C15 H13 N



CC 35 (Synthetic High Polymers)

IT 9003-39-8P 24936-41-2P 24936-44-5P 24936-47-8P 24936-50-3P  
24936-57-0P 24936-58-1P 24936-63-8P 24991-47-7P 25036-01-5P  
25067-59-8P 25232-41-1P **25569-44-2P** 27756-34-9P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, rate consts. in)

L55 ANSWER 32 OF 34 HCA COPYRIGHT 2003 ACS

69:77939 Radiation polymerization of 3-vinyl-9-isopropylcarbazole and electrophysical properties of the polymer. Budnikova, E. S.; Sirotkina, E. E.; Lopatinskii, V. P.; Igumnova, M. A. (Sib. Fiz.-Tech. Inst. im. Kuznetsova, Tomsk, USSR). Vysokomolekulyarnye Soedineniya, Seriya B: Kratkie Soobshcheniya, 10(6), 447-8 (Russian) 1968. CODEN: VYSBAI. ISSN: 0507-5483.

AB Poly(3-vinyl-9-isopropylcarbazole) (I) prepd. under <sup>60</sup>Co irradiation and by thermal polymerization was compared in phys. properties. Monomer conversion and mol. wt. increased as the irradiation dose increased. Activation energies of dipole-segmental relaxation of I prepd. by irradiation and thermal processes were 114 and 79 kcal./mole, glass transition point 193 and 184.degree., and d. 1.28 and 1.19 g./cc., resp. I prepd. by irradiation had better dielectric properties. Plots of tan .delta. (dielectric loss) and .epsilon. (dipole-segmental relaxation activation energy) vs. temp., and tan .delta. vs. log frequency are given. X-ray study showed that I prepd. by irradiation contained a significant amt. of crystalline phase whereas I prepd. thermally was amorphous.

IT **29159-99-7P**

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and dielectric properties of)

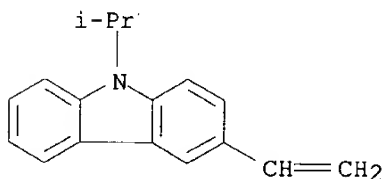
RN 29159-99-7 HCA

CN Carbazole, 9-isopropyl-3-vinyl-, polymers (8CI) (CA INDEX NAME)

CM 1

CRN 3007-04-3

CMF C17 H17 N



CC 35 (Synthetic High Polymers)

IT 29159-99-7P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and dielec. properties of)

L55 ANSWER 33 OF 34 HCA COPYRIGHT 2003 ACS

69:44330 Electron paramagnetic resonance in irradiated polymers based on carbazole. Budnikova, E. S.; Mikhailova, T. G.; Sirotkina, E. E.; Lopatinskii, V. P. (Sib. Fiz.-Tekh. Inst. im. Kuznetsova, Tomsk, USSR). Izvestiya Vysshikh Uchebnykh Zavedenii, Fizika, 11(5), 128-30 (Russian) 1968. CODEN: IVUFAC. ISSN: 0021-3411.

AB The mechanism of crosslinking in poly(3-vinyl-9-methylcarbazole) (I), poly(3-vinyl-9-ethylcarbazole) (II), and poly(3-vinyl-9-isopropylcarbazole) (III) irradiated with  $^{60}\text{Co}$  was studied by E.P.R. spectra which are given. Single peaks having  $g = 2.004$  and with  $\Delta H_{\text{max}} = 10\text{e}$  were observed for I and II, while III having the same  $g$ -factor as above gave a complex signal. The study of E.P.R. spectra of the corresponding monomers and  $N$ -substituted carbazoles showed that the irradiation resulted in the formation of free radicals in the carbazole ring of all 3 polymers; however, in the case of III a radical was formed also in the  $\text{Pr}$  substituent.

IT 25569-44-2 29159-99-7

RL: RCT (Reactant); RACT (Reactant or reagent)  
(crosslinking of, by  $\gamma$ -irradiation, mechanism of, E.S.R. in relation to)

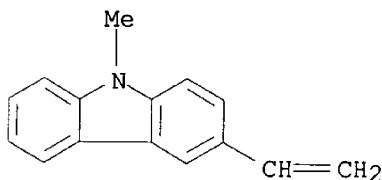
RN 25569-44-2 HCA

CN Carbazole, 9-methyl-3-vinyl-, polymers (8CI) (CA INDEX NAME)

CM 1

CRN 1486-08-4

CMF C15 H13 N



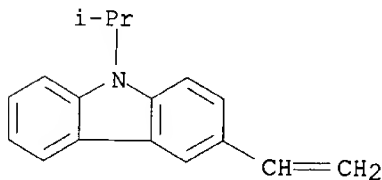
RN 29159-99-7 HCA

CN Carbazole, 9-isopropyl-3-vinyl-, polymers (8CI) (CA INDEX NAME)

CM 1

CRN 3007-04-3

CMF C17 H17 N



CC 36 (Plastics Manufacture and Processing)

IT 25569-44-2 25569-45-3 29159-99-7

RL: RCT (Reactant); RACT (Reactant or reagent)  
(crosslinking of, by .gamma.-irradiation, mechanism of, E.S.R. in relation to)

L55 ANSWER 34 OF 34 HCA COPYRIGHT 2003 ACS

67:22260 Spectral characteristics and reactivity of some vinyl heterocyclic monomers in radical polymerization. Chernobai, A. V.; Tirak'yants, Zh. S.; Delyatitskaya, R. Ya. Vysokomolekulyarnye Soedineniya, Seriya A, 9(3), 664-71 (Russian) 1967. CODEN: VYSAAF. ISSN: 0507-5475.

AB A bathochromic shift in the uv absorption spectra of the title monomers indicated an increase in conjugation and also coincided with an increase in polymn. rates. Rate consts. (k) were calcd. from  $k = [(2.303/t) \log A_0/A] \cdot \text{times. } 10^4$  (where  $A_0$  and  $A$  are the monomer concns. in mole/l. initially and at time  $t$ , resp.). Spectra were taken in dioxane and polymn. kinetics were followed by dilatometry. The following kinetic results of the polymn. at 70.degree. in cyclohexanone with 0.01 mole/l. azobisisobutyronitrile were given (monomer,  $A_0$ , and  $k$  in min.<sup>-1</sup> given): PhCH:CH<sub>2</sub>, 1.0, 9.4  $\pm$  0.4; p-H<sub>2</sub>C:CHC<sub>6</sub>H<sub>4</sub>Ph, 1.0, 24.8  $\pm$  1.3; o-H<sub>2</sub>C:CHC<sub>6</sub>H<sub>4</sub>OPh, 0.5, 32.7  $\pm$  3.9; 3-vinyl-9-methylcarbazole, 0.5, 19.3  $\pm$  3.5; 9-vinylcarbazole, 0.5, 94.5  $\pm$  2.4; 1-vinyl-2-pyrrolidinone, 1.0, 18.9  $\pm$  0.3; 2-vinylpyridine, 1.0, 20.2  $\pm$  1.5; 2-methyl-5-vinylpyridine, 1.0, 22.0  $\pm$  3.1; 4-vinylpyridine, 42.8  $\pm$  4.5. Graphs of uv spectra and time-log( $A_0/A$ ) plots were reproduced.

IT 25569-44-2P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, kinetics of radical, conjugation and spectra in relation to)

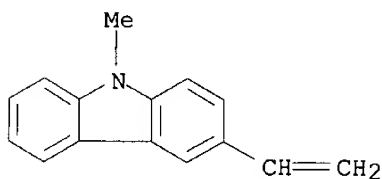
RN 25569-44-2 HCA

CN Carbazole, 9-methyl-3-vinyl-, polymers (8CI) (CA INDEX NAME)

CM 1

CRN 1486-08-4

CMF C15 H13 N



CC 35 (Synthetic High Polymers)

IT 9003-39-8P 25014-15-7P 25038-86-2P 25067-59-8P 25232-08-0P

25232-41-1P 25569-44-2P 30525-83-8P

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of, kinetics of radical, conjugation and spectra in relation to)